

UNIVERSIDAD DE CANTABRIA  
ESCUELA SUPERIOR DE LA MARINA CIVIL

-----  
DEPARTAMENTO DE CIENCIAS Y TÉCNICAS  
DEL AGUA Y DEL MEDIO AMBIENTE  
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## TESIS DOCTORAL

DEPURACION DE AGUAS RESIDUALES EN UN  
CONTACTOR BIOLÓGICO ROTATIVO (RBC) CON  
ALTERNANCIA EN EL SENTIDO DEL FLUJO

TOMO II

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SANTANDER FEBRERO 1993

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## APENDICE 1

## DQO (ppm)

<b>EXPERIMENTO 1</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	150.00	81.00	39.00	150.00	102.00	53.00
48	150.00	46.00	28.00	150.00	25.00	18.00
72	150.00	28.16	10.56	150.00	21.12	14.08
96	150.00	29.00	21.00	150.00	29.00	29.00
120	150.00	17.60	14.08	150.00	52.80	28.16
144	150.00	14.08	7.04	150.00	7.04	3.50
168	150.00	14.08	8.80	150.00	17.60	10.56
192	150.00	12.20	9.50	150.00	12.20	6.10
216	150.00	14.00	7.00	150.00	14.80	10.00
240	150.00	28.00	14.00	150.00	17.50	14.00
264	150.00	28.00	14.00	150.00	24.50	17.50

## DQO (ppm)

<b>EXPERIMENTO 2</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	150.00	7.00	3.50	150.00	24.50	3.50
24	150.00	24.50	7.00	150.00	14.00	3.50
36	150.00	17.50	3.50	150.00	12.25	3.50
48	150.00	10.50	0.00	150.00	10.50	3.50
60	150.00	49.00	28.00	150.00	14.00	14.00
72	150.00	35.00	35.00	150.00	28.00	14.00
84	150.00	42.00	31.00	150.00	42.00	14.00
96	150.00	42.00	17.00	150.00	28.00	14.00
108	150.00	14.00	0.00	150.00	7.00	7.00
120	150.00	31.50	21.00	150.00	17.50	15.50
144	150.00	49.00	42.00	150.00	28.00	24.00
156	150.00	22.40	8.00	150.00	28.80	3.20
168	150.00	19.20	0.00	150.00	19.20	15.00
180	150.00	38.40	16.30	150.00	12.80	0.00
192	150.00	19.20	0.00	150.00	6.40	6.40
204	150.00	32.00	12.80	150.00	19.20	3.20
216	150.00	25.60	19.20	150.00	19.80	12.80
228	150.00	16.00	6.40	150.00	19.50	16.00
240	150.00	51.20	12.80	150.00	19.20	19.20
252	150.00	16.20	0.00	150.00	3.20	3.20

## DQO (ppm)

<b>EXPERIMENTO 3</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	150.00	42.60	14.20	150.00	21.30	21.30
36	150.00	28.40	24.80	150.00	17.90	7.20
48	150.00	21.30	7.60	150.00	14.20	7.60
60	150.00	28.40	17.20	150.00	21.30	18.00
72	150.00	42.60	21.30	150.00	28.40	28.40
84	150.00	31.95	24.85	150.00	24.85	17.75
96	150.00	39.00	20.70	150.00	24.85	24.85
108	150.00	35.50	0.00	150.00	14.20	0.00
120	150.00	39.05	17.75	150.00	10.65	10.65
132	150.00	37.27	12.42	150.00	28.40	14.20
144	150.00	35.50	7.10	150.00	14.20	0.00
156	150.00	21.30	0.00	150.00	21.30	0.00
168	150.00	14.20	7.10	150.00	24.80	3.55
180	150.00	28.40	21.30	150.00	28.40	7.10
192	150.00	21.30	14.20	150.00	42.60	14.20
204	150.00	35.50	7.10	150.00	42.60	0.00



# DQO (ppm)

<b>EXPERIMENTO 4</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	300.00	67.45	46.15	300.00	53.25	17.17
24	300.00	49.70	28.40	300.00	49.70	39.10
36	300.00	63.90	28.40	300.00	67.45	39.05
48	300.00	71.00	35.50	300.00	85.20	39.00
60	300.00	42.90	25.15	300.00	46.30	19.50
72	300.00	14.80	14.80	300.00	7.40	0.00
84	300.00	44.40	22.20	300.00	51.80	22.20
96	300.00	70.30	22.20	300.00	81.80	22.20
108	300.00	96.20	29.60	300.00	66.60	22.20
120	300.00	44.40	37.00	300.00	66.60	29.60
132	300.00	59.20	51.80	300.00	51.80	0.00
144	300.00	51.80	44.40	300.00	88.80	37.00
156	300.00	111.00	37.00	300.00	118.40	37.00
168	300.00	140.60	44.40	300.00	44.40	37.00
180	300.00	125.80	29.60	300.00	66.60	37.00
192	300.00	37.00	29.60	300.00	103.60	66.60
204	300.00	88.80	51.80	300.00	88.80	44.40
216	300.00	59.20	37.00	300.00	49.70	28.40
228	300.00	74.00	22.20	300.00	66.60	51.80
240	300.00	81.40	96.20	300.00	37.00	29.60
252	300.00	103.60	51.80	300.00	74.00	51.80
264	300.00	88.80	51.80	300.00	77.70	48.10
276	300.00	74.00	51.80	300.00	81.40	44.40
288	300.00	162.80	44.40	300.00	51.80	22.20
300	300.00	59.20	44.40	300.00	66.60	29.60
312	300.00	81.40	51.80	300.00	66.60	44.40

# DOO (ppm)

<b>EXPERIMENTO 4</b> (Continuación)						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
312	300.00	81.40	51.80	300.00	66.60	44.40
324	300.00	66.60	59.20	300.00	81.40	59.20
336	300.00	51.80	37.00	300.00	59.20	33.30
348	300.00	51.80	44.40	300.00	59.20	33.30
360	300.00	66.60	22.20	300.00	37.00	7.40
372	300.00	51.80	44.40	300.00	29.60	22.20
384	300.00	103.60	44.40	300.00	14.80	7.40
396	300.00	81.40	40.70	300.00	37.00	29.60
408	300.00	59.20	37.00	300.00	118.4	29.60
420	300.00	88.80	59.20	300.00	111.0	29.60
432	300.00	88.80	88.80	300.00	44.40	29.60
444	300.00	59.20	51.80	300.00	44.40	37.00
456	300.00	66.60	29.60	300.00	32.70	29.00
468	300.00	70.00	49.00	300.00	21.00	21.00
480	300.00	56.00	49.00	300.00	49.00	21.00
492	300.00	77.00	56.00	300.00	56.00	38.50
504	300.00	63.00	42.00	300.00	35.00	28.00
516	300.00	98.00	31.00	300.00	105.0	49.00
528	300.00	84.00	42.00	300.00	28.00	10.50
540	300.00	98.00	49.00	300.00	63.00	42.00
552	300.00	87.50	52.50	300.00	52.50	35.00
564	300.00	77.00	56.00	300.00	42.00	28.00
576	300.00	91.00	35.00	300.00	31.50	17.50
588	300.00	56.00	21.00	300.00	21.00	7.00
600	300.00	42.00	28.00	300.00	35.00	21.00
612	300.00	14.00	7.00	300.00	56.00	7.00

# DQO (ppm)

EXPERIMENTO 5						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	300.00	224.00	210.00	300.00	266.00	203.00
24	300.00	126.00	63.00	300.00	147.00	70.00
36	300.00	49.00	28.00	300.00	35.00	14.00
48	300.00	84.00	45.50	300.00	49.00	10.50
60	300.00	126.00	31.50	300.00	14.00	7.00
72	300.00	28.00	14.00	300.00	14.00	7.00
84	300.00	77.00	42.00	300.00	56.00	35.00
96	300.00	63.00	35.00	300.00	35.00	35.00
108	300.00	126.00	28.50	300.00	63.00	28.50
120	300.00	98.00	35.00	300.00	70.00	28.00
132	300.00	94.50	38.50	300.00	28.00	7.00
144	300.00	91.00	28.00	300.00	42.00	7.00
156	300.00	70.00	56.00	300.00	70.00	28.00
168	300.00	63.00	49.00	300.00	42.00	35.00
180	300.00	98.00	28.00	300.00	35.00	35.00
192	300.00	70.00	21.00	300.00	35.00	21.00
204	300.00	77.00	28.00	300.00	35.00	7.00
216	300.00	84.00	28.00	300.00	70.00	28.00
228	300.00	35.00	28.00	300.00	28.00	0.00
240	300.00	49.00	28.00	300.00	21.00	10.50
252	300.00	56.00	21.00	300.00	21.00	14.00
264	300.00	70.00	21.00	300.00	49.00	14.00
276	300.00	77.00	49.00	300.00	49.00	14.00
288	300.00	56.00	49.00	300.00	42.00	35.00
300	300.00	126.00	35.00	300.00	35.00	28.00
312	300.00	49.00	21.00	300.00	28.00	21.00
324	300.00	56.00	28.00	300.00	21.00	14.00
336	300.00	98.00	21.00	300.00	7.00	0.00
348	300.00	79.00	21.00	300.00	35.00	0.00

## DQO (ppm)

<b>EXPERIMENTO 6</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	300.00	294.00	287.00	300.00	287.00	245.00
24	300.00	189.00	140.00	300.00	196.00	189.00
36	300.00	133.00	70.00	300.00	119.00	91.00
48	300.00	112.00	63.00	300.00	84.00	63.00
60	300.00	56.00	42.00	300.00	35.00	35.00
72	300.00	56.00	42.00	300.00	84.00	28.00
84	300.00	126.00	49.00	300.00	63.00	26.00
96	300.00	24.00	0.00	300.00	42.00	24.00
108	300.00	63.00	42.00	300.00	42.00	28.00
120	300.00	56.00	28.00	300.00	49.00	38.00
132	300.00	35.00	17.00	300.00	21.00	21.00
144	300.00	34.50	27.20	300.00	34.00	13.60
156	300.00	34.00	27.20	300.00	20.40	20.40
168	300.00	34.00	13.60	300.00	40.80	34.00
180	300.00	20.40	20.40	300.00	27.20	27.20
192	300.00	40.80	20.40	300.00	102.00	34.00
204	300.00	27.20	27.20	300.00	34.00	6.80
216	300.00	40.80	13.60	300.00	13.60	13.60
228	300.00	27.20	13.60	300.00	34.00	13.60
240	300.00	27.20	0.00	300.00	34.00	6.80
252	300.00	27.20	27.20	300.00	54.40	23.30
264	300.00	54.40	13.60	300.00	40.80	13.60
276	300.00	40.80	6.80	300.00	34.00	6.80
288	300.00	88.40	17.10	300.00	20.40	0.00
300	300.00	0.00	0.00	300.00	13.60	0.00
312	300.00	34.00	20.40	300.00	27.20	13.60

## DQO (ppm)

<b>EXPERIMENTO 7</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	450.00	367.20	360.60	450.00	353.60	340.00
24	450.00	360.40	316.40	450.00	414.80	367.40
36	450.00	258.40	145.80	450.00	326.40	224.40
48	450.00	200.60	100.20	450.00	238.00	130.70
60	450.00	142.80	54.60	450.00	149.60	37.00
72	450.00	95.20	27.20	450.00	142.80	20.40
84	450.00	81.60	20.40	450.00	156.40	34.00
96	450.00	108.80	34.00	450.00	158.00	34.00
108	450.00	88.40	34.00	450.00	34.00	20.40
120	450.00	68.00	13.60	450.00	81.60	13.60
132	450.00	54.40	13.80	450.00	81.60	40.80
144	450.00	47.60	13.60	450.00	20.40	20.40
156	450.00	34.00	34.00	450.00	34.00	27.00
168	450.00	47.60	6.80	450.00	47.60	13.60
180	450.00	40.80	20.40	450.00	61.20	13.60
192	450.00	34.00	27.20	450.00	40.80	34.00
204	450.00	27.20	13.60	450.00	54.40	54.40
216	450.00	47.60	13.60	450.00	47.60	44.00

## DOO (ppm)

<b>EXPERIMENTO 8</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	450.00	435.20	411.00	450.00	360.40	340.00
24	450.00	401.00	377.00	450.00	278.80	81.60
36	450.00	306.00	183.60	450.00	238.00	142.80
48	450.00	190.40	54.40	450.00	156.40	31.00
60	450.00	108.80	40.80	450.00	108.80	13.60
72	450.00	129.40	54.40	450.00	54.40	13.60
84	450.00	122.40	30.20	450.00	74.80	54.40
96	450.00	95.20	0.00	450.00	6.80	0.00
108	450.00	47.60	34.00	450.00	40.80	40.80
120	450.00	81.60	40.80	450.00	34.00	34.00
132	450.00	47.60	23.40	450.00	74.80	9.80
144	450.00	27.20	20.40	450.00	54.40	18.50
156	450.00	20.40	6.80	450.00	34.00	27.20
168	450.00	54.40	16.60	450.00	47.60	30.20
180	450.00	34.00	20.40	450.00	34.00	34.00
192	450.00	47.60	13.80	450.00	47.60	23.40
204	450.00	40.80	3.40	450.00	47.60	13.60
216	450.00	129.20	20.40	450.00	40.80	20.40
228	450.00	88.40	9.80	450.00	68.00	20.40
240	450.00	115.60	13.80	450.00	88.40	20.40
252	450.00	115.60	13.80	450.00	88.40	20.40
264	450.00	115.60	13.80	450.00	88.40	20.40

## DQO (ppm)

<b>EXPERIMENTO 9</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	450.00	435.20	391.00	450.00	442.00	408.00
36	450.00	367.20	299.20	450.00	299.20	220.50
48	450.00	306.00	132.60	450.00	238.00	88.60
60	450.00	248.20	113.90	450.00	193.80	71.50
72	450.00	190.40	95.20	450.00	149.60	54.40
84	450.00	197.20	57.80	450.00	102.00	44.20
96	450.00	183.60	54.40	450.00	74.80	40.80
108	450.00	163.20	61.40	450.00	74.80	50.60
120	450.00	156.40	63.20	450.00	129.20	41.00
132	450.00	95.20	34.00	450.00	122.35	39.00
144	450.00	122.40	54.40	450.00	115.50	37.00
156	450.00	54.40	23.60	450.00	54.40	34.20
168	450.00	115.60	34.00	450.00	61.20	23.60
180	450.00	88.40	47.60	450.00	170.00	47.60
192	450.00	74.80	40.80	450.00	27.20	27.20
204	450.00	40.80	20.40	450.00	34.00	27.20
216	450.00	74.80	10.00	450.00	115.60	34.00
228	450.00	95.20	18.60	450.00	74.80	34.00
240	450.00	115.60	27.20	450.00	34.00	34.00
252	450.00	108.80	27.40	450.00	40.80	20.40
264	450.00	108.80	20.40	450.00	47.60	27.20

# TOC (ppm)

<b>EXPERIMENTO 1</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
0	45.54	16.64	13.32	45.54	11.28	6.22
24	45.54	14.73	6.34	45.54	10.13	8.93
48	45.54	7.61	7.26	45.54	9.47	6.71
72	45.54	8.80	5.30	45.54	9.90	4.70
96	45.54	7.85	3.50	45.54	9.80	5.14
120	45.54	12.46	7.62	45.54	15.32	12.30
144	45.54	7.03	4.15	45.54	5.95	5.38
168	45.54	6.31	5.78	45.54	5.17	4.84
192	45.54	16.60	4.38	45.54	6.80	4.88
216	45.54	18.56	6.34	45.54	7.78	5.28
240	45.54	17.58	5.36	45.54	8.76	5.68
264	45.54	9.27	4.94	45.54	10.39	5.72



## TOC (ppm)

<b>EXPERIMENTO 2</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	45.54	5.78	5.75	45.54	13.43	11.18
24	45.54	13.91	5.61	45.54	10.29	5.33
36	45.54	12.02	5.00	45.54	9.59	4.73
48	45.54	10.14	4.40	45.54	8.90	4.14
60	45.54	12.07	6.90	45.54	11.90	9.80
72	45.54	10.08	7.77	45.54	9.19	15.91
84	45.54	12.42	10.70	45.54	6.49	6.11
96	45.54	13.49	7.68	45.54	11.73	7.28
108	45.54	10.57	4.68	45.54	8.13	6.14
120	45.54	7.53	3.95	45.54	9.73	8.71
144	45.54	16.93	10.52	45.54	11.33	11.28
156	45.54	10.93	6.00	45.54	6.38	4.77
168	45.54	9.81	5.48	45.54	10.35	6.32
180	45.54	15.22	10.06	45.54	10.68	5.74
192	45.54	11.37	6.15	45.54	13.11	6.77
204	45.54	13.63	8.42	45.54	11.11	4.89
216	45.54	13.35	15.91	45.54	16.66	9.67
228	45.54	19.81	14.98	45.54	18.30	12.07
240	45.54	30.33	22.69	45.54	20.00	14.48
252	45.54	22.00	13.00	45.54	9.17	7.95

## TOC (ppm)

<b>EXPERIMENTO 3</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
24	45.54	21.70	16.43	45.54	16.15	15.80
36	45.54	21.91	14.83	45.54	14.79	12.70
48	45.54	15.14	7.40	45.54	11.10	9.35
60	45.54	16.60	11.08	45.54	12.16	10.83
72	45.54	16.06	12.37	45.54	13.22	12.31
84	45.54	10.37	6.37	45.54	8.62	6.88
96	45.54	10.97	5.85	45.54	7.21	5.77
108	45.54	11.57	5.33	45.54	5.80	4.66
120	45.54	12.89	6.31	45.54	7.48	4.64
132	45.54	14.22	7.29	45.54	9.17	4.62
144	45.54	15.55	8.28	45.54	10.86	4.60
156	45.54	10.87	4.25	45.54	13.13	4.11
168	45.54	10.60	4.73	45.54	12.26	4.31
180	45.54	10.20	5.73	45.54	10.30	4.71
192	45.54	9.93	6.22	45.54	9.43	4.91
204	45.54	9.92	6.20	45.54	9.03	4.98

# TOC (ppm)

EXPERIMENTO 4						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	91.08	14.86	14.86	91.08	17.64	15.40
24	91.08	28.22	18.50	91.08	21.59	10.63
36	91.08	27.85	16.43	91.08	24.36	11.51
48	91.08	27.49	14.36	91.08	27.14	12.40
60	91.08	27.41	7.57	91.08	20.56	8.92
72	91.08	20.56	14.79	91.08	13.98	8.21
84	91.08	29.25	13.32	91.08	21.50	9.12
96	91.08	37.95	11.86	91.08	29.01	10.04
108	91.08	28.65	12.12	91.08	23.30	11.80
120	91.08	12.36	10.98	91.08	13.19	9.29
132	91.08	12.84	10.64	91.08	22.57	10.80
144	91.08	18.09	17.09	91.08	31.96	12.32
156	91.08	28.70	10.26	91.08	11.40	6.96
168	91.08	35.59	9.33	91.08	19.91	9.30
180	91.08	28.21	10.91	91.08	28.01	11.30
192	91.08	20.83	12.50	91.08	36.22	13.65
204	91.08	26.76	13.57	91.08	24.78	13.85
216	91.08	22.83	12.98	91.08	21.06	14.11
228	91.08	24.10	11.74	91.08	14.50	9.30
240	91.08	25.86	16.34	91.08	15.85	10.75
252	91.08	25.33	14.54	91.08	14.43	9.31
264	91.08	26.34	16.13	91.08	14.73	9.75
276	91.08	27.54	17.73	91.08	15.13	10.75
288	91.08	28.56	19.32	91.08	15.37	11.19
300	91.08	21.83	16.33	91.08	15.98	10.26
312	91.08	22.63	14.98	91.08	24.06	13.27

# TOC (ppm)

<b>EXPERIMENTO 4</b> (Continuación)						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
324	91.08	13.98	14.25	91.08	8.45	6.87
336	91.08	16.64	14.32	91.08	10.81	7.57
348	91.08	19.05	15.37	91.08	12.81	8.37
360	91.08	27.42	17.06	91.08	15.17	9.08
372	91.08	17.27	14.79	91.08	8.19	6.65
384	91.08	27.31	17.59	91.08	10.54	10.27
396	91.08	25.19	17.11	91.08	10.93	14.36
408	91.08	23.07	16.63	91.08	35.05	9.21
420	91.08	27.73	13.79	91.08	27.98	12.60
432	91.08	32.40	10.95	91.08	20.91	16.00
444	91.08	18.30	17.79	91.08	18.33	12.26
456	91.08	21.30	23.20	91.08	17.90	11.75
468	91.08	23.36	22.18	91.08	17.54	11.85
480	91.08	26.36	24.60	91.08	17.12	11.64
492	91.08	23.78	19.28	91.08	15.81	9.68
504	91.08	21.20	13.96	91.08	14.50	7.72
516	91.08	13.43	11.15	91.08	32.23	11.18
528	91.08	18.68	13.85	91.08	11.21	8.78
540	91.08	29.72	14.03	91.08	10.95	9.44
552	91.08	28.84	16.57	91.08	11.53	9.41
564	91.08	27.96	19.11	91.08	12.11	9.38
576	91.08	28.12	14.29	91.08	37.75	7.88
588	91.08	17.31	14.56	91.08	9.25	6.75
600	91.08	18.74	15.14	91.08	7.84	7.49
612	91.08	21.31	11.89	91.08	19.30	6.40
624					6.98	7.19

# TOC (ppm)

<b>EXPERIMENTO 5</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
0	91.08	69.70	31.24	91.08	74.32	63.51
12	91.08	43.08	29.85	91.08	53.58	23.34
24	91.08	23.18	17.23	91.08	19.60	11.64
36	91.08	18.11	15.23	91.08	11.92	8.81
48	91.08	28.55	13.50	91.08	10.85	9.63
60	91.08	20.24	14.78	91.08	7.38	7.37
72	91.08	28.56	14.82	91.08	10.26	7.86
84	91.08	32.50	15.06	91.08	14.26	8.66
96	91.08	40.83	15.11	91.08	17.10	9.16
108	91.08	27.42	12.40	91.08	17.16	8.09
120	91.08	31.84	12.63	91.08	14.67	12.33
132	91.08	36.26	15.55	91.08	18.66	8.54
144	91.08	36.28	16.06	91.08	12.42	11.46
156	91.08	16.98	14.69	91.08	12.29	8.30
168	91.08	33.23	16.81	91.08	11.50	8.17
180	91.08	27.13	18.57	91.08	11.02	8.98
192	91.08	23.74	16.04	91.08	10.54	9.79
204	91.08	19.70	15.03	91.08	13.34	9.56
216	91.08	16.32	14.03	91.08	16.14	9.34
228	91.08	18.33	13.56	91.08	14.04	8.82
240	91.08	27.14	26.85	91.08	11.74	11.30
252	91.08	26.12	14.39	91.08	21.82	9.66
264	91.08	20.47	14.62	91.08	16.88	9.88
276	91.08	17.48	13.10	91.08	18.17	6.81
288	91.08	30.60	18.05	91.08	11.65	6.96
300	91.08	15.15	11.98	91.08	10.47	7.18
312	91.08	24.32	2.86	91.08	9.29	7.41
324	91.08	41.13	13.14	91.08	12.62	4.95
336	91.08	15.33	9.13	91.08	13.40	5.16

# TOC (ppm)

<b>EXPERIMENTO 6</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	91.08	92.01	89.29	91.08	86.95	82.70
24	91.08	69.47	57.16	91.08	69.62	65.36
36	91.08	39.14	16.35	91.08	42.59	26.22
48	91.08	40.66	17.87	91.08	35.38	23.18
60	91.08	27.00	16.52	91.08	16.36	12.25
72	91.08	34.18	18.61	91.08	21.34	13.83
84	91.08	39.37	18.89	91.08	21.18	14.69
96	91.08	24.60	18.43	91.08	21.03	15.56
108	91.08	20.80	10.57	91.08	18.95	12.84
120	91.08	22.63	11.80	91.08	19.85	16.39
132	91.08	11.69	10.52	91.08	15.84	12.05
144	91.08	14.09	13.25	91.08	13.70	11.02
156	91.08	15.92	9.68	91.08	15.72	11.03
168	91.08	17.95	12.58	91.08	17.75	11.05
180	91.08	9.66	9.50	91.08	13.72	13.48
192	91.08	15.89	13.28	91.08	16.24	14.16
204	91.08	10.29	8.30	91.08	13.55	12.00
216	91.08	10.70	6.72	91.08	10.90	8.16
228	91.08	15.89	11.61	91.08	15.94	11.77
240	91.08	18.55	8.83	91.08	19.78	8.49
252	91.08	14.12	8.66	91.08	18.97	7.79
264	91.08	15.83	7.67	91.08	13.41	7.32
276	91.08	24.27	10.70	91.08	16.06	8.72
288	91.08	32.16	14.68	91.08	14.15	9.87
300	91.08	13.44	12.35	91.08	16.35	8.40
312	91.08	11.41	9.81	91.08	15.83	10.45

# TOC (ppm)

<b>EXPERIMENTO 7</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	136.60	104.10	103.36	136.60	103.28	97.45
24	136.60	109.97	101.81	136.60	113.37	106.00
36	136.60	80.12	53.37	136.60	98.52	72.00
48	136.60	66.84	38.96	136.60	74.29	46.22
60	136.60	53.57	24.55	136.60	50.07	20.45
72	136.60	44.00	26.36	136.60	55.70	20.21
84	136.60	38.15	15.00	136.60	50.43	14.34
96	136.60	40.80	14.15	136.60	48.14	13.90
108	136.60	34.54	12.66	136.60	26.83	14.54
120	136.60	27.32	14.48	136.60	33.00	14.29
132	136.60	13.72	13.97	136.60	22.44	11.90
144	136.60	15.07	12.68	136.60	15.01	14.73
156	136.60	12.48	10.56	136.60	18.56	10.96
168	136.60	12.64	11.24	136.60	11.74	5.88
180	136.60	12.47	9.31	136.60	24.01	9.32
192	136.60	14.74	13.62	136.60	15.00	13.25
204	136.60	11.48	8.28	136.60	17.31	15.01
216	136.60	16.95	3.54	136.60	17.80	16.00

# TOC (ppm)

<b>EXPERIMENTO 8</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
12	136.60	68.50	64.54	136.60	65.70	66.52
24	136.60	71.23	69.22	136.60	68.54	39.67
36	136.60	75.87	63.78	136.60	69.28	49.39
48	136.60	46.89	16.86	136.60	44.47	14.09
60	136.60	51.58	19.59	136.60	38.47	12.72
72	136.60	36.44	16.39	136.60	26.77	6.60
84	136.60	38.68	19.59	136.60	25.57	12.48
96	136.60	29.96	11.81	136.60	24.57	12.54
108	136.60	14.90	12.59	136.60	15.81	16.37
120	136.60	23.26	10.08	136.60	10.29	7.46
132	136.60	18.62	9.13	136.60	31.06	8.02
144	136.60	11.74	7.59	136.60	27.50	8.80
156	136.60	12.32	12.24	136.60	23.94	9.37
168	136.60	13.55	7.39	136.60	17.29	8.15
180	136.60	11.08	8.95	136.60	17.65	11.64
192	136.60	12.40	9.96	136.60	17.09	9.09
204	136.60	13.98	7.98	136.60	20.84	9.65
216	136.60	17.63	8.77	136.60	22.06	12.09
228	136.60	21.28	9.56	136.60	23.28	14.54
240	136.60	23.25	7.54	136.60	27.71	9.04
252	136.60	26.00	12.70	136.60	14.35	11.55
264	136.60	27.00	13.01	136.60	12.25	10.50



# TOC (ppm)

<b>EXPERIMENTO 9</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	136.60	44.43	35.16	136.60	47.40	44.20
36	136.60	46.26	29.55	136.60	47.41	45.16
48	136.60	49.82	39.93	136.60	47.40	27.58
60	136.60	52.29	32.58	136.60	46.19	23.54
72	136.60	54.76	25.24	136.60	44.98	19.50
84	136.60	52.14	29.68	136.60	35.96	16.87
96	136.60	45.36	20.75	136.60	31.72	14.75
108	136.60	41.49	23.92	136.60	30.52	15.32
120	136.60	39.36	22.21	136.60	29.33	15.92
132	136.60	37.23	20.51	136.60	28.13	16.51
144	136.60	35.11	18.81	136.60	26.94	17.11
156	136.60	32.98	17.11	136.60	25.75	17.73
168	136.60	30.86	15.41	136.60	17.26	15.94
180	136.60	32.15	14.69	136.60	17.89	16.56
192	136.60	30.99	15.10	136.60	14.26	11.50
204	136.60	17.90	11.10	136.60	13.93	9.75
216	136.60	28.14	8.87	136.60	14.17	12.50
228	136.60	28.24	10.40	136.60	13.77	11.73
240	136.60	28.35	11.93	136.60	13.38	10.97
252	136.60	27.56	11.03	136.60	10.31	10.22
264	136.60	19.29	11.13	136.60	13.85	13.32

# CONDUCTIVIDAD ( $\mu\text{S/cm}$ )

<b>EXPERIMENTO 1</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
24	976	879	875	976	871	979
48	976	833	1117	976	846	899
72	976	829	925	976	821	993
96	976	891	893	976	866	879
120	976	899	997	976	911	864
144	976	997	974	976	978	950
168	976	1040	1104	976	1053	1056
192	976	972	946	976	905	908
216	976	919	905	976	840	826
240	976	913	900	976	864	848
264	976	907	895	976	889	870

# CONDUCTIVIDAD ( $\mu\text{S/cm}$ )

<b>EXPERIMENTO 2</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	976	943	1040	976	938	910
36	976	944	985	976	928	907
48	976	946	928	976	925	904
60	976	956	948	976	891	877
72	976	966	967	976	857	847
84	976	956	954	976	900	910
96	976	946	941	976	983	973
108	976	923	913	976	980	904
120	976	944	937	976	901	911
132	976	942	933	976	923	921
144	976	941	930	976	944	931
156	976	991	966	976	947	929
168	976	1040	1002	976	950	927
180	976	961	941	976	956	949
192	976	913	917	976	939	907
204	976	961	948	976	946	948
216	976	959	955	976	972	960
228	976	974	974	976	991	1055
240	976	980	981	976	967	968

# CONDUCTIVIDAD ( $\mu\text{S/cm}$ )

<b>EXPERIMENTO 3</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	976	999	1046	976	980	993
36	976	960	980	976	990	1002
48	976	1015	983	976	1019	1024
60	976	1007	1000	976	926	933
72	976	1020	1053	976	1008	999
84	976	990	971	976	969	972
96	976	975	959	976	970	953
108	976	966	960	976	968	970
120	976	949	967	976	951	943
132	976	893	895	976	936	924
144	976	975	934	976	955	944
156	976	968	955	976	937	930
168	976	933	930	976	868	863
180	976	924	902	976	883	851
192	976	963	949	976	945	927
204	976	969	947	976	948	921

# CONDUCTIVIDAD ( $\mu\text{S/cm}$ )

<b>EXPERIMENTO 4</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	1159	1044	1021	1159	1026	1018
24	1159	1064	1041	1159	1069	1064
36	1159	1026	1008	1159	890	873
48	1159	1062	1016	1159	1034	1000
60	1159	1057	1022	1159	1034	1014
72	1159	1089	1095	1159	1101	1094
84	1159	1115	1089	1159	1102	1079
96	1159	1156	1124	1159	1121	1109
108	1159	1152	1123	1159	1126	1123
120	1159	1183	1146	1159	1182	1169
132	1159	1101	1045	1159	1118	1123
144	1159	1111	1079	1159	1105	1105
156	1159	1089	1045	1159	1091	1083
168	1159	1118	1082	1159	1123	1137
180	1159	1138	1061	1159	1069	1071
192	1159	1190	1132	1159	1178	1173
204	1159	1196	1157	1159	1161	1174
216	1159	1180	1178	1159	1214	1207
228	1159	1189	1143	1159	1150	1094
240	1159	1167	1111	1159	1146	1138
252	1159	1148	1048	1159	1118	1102
264	1159	1138	1068	1159	1151	1216
276	1159	1125	1098	1159	1121	1085
288	1159	1104	1021	1159	1092	1081
300	1159	1085	1082	1159	1088	1091
312	1159	1083	1046	1159	1089	1072
324	1159	1059	1013	1159	1038	1011

# CONDUCTIVIDAD ( $\mu\text{S/cm}$ )

<b>EXPERIMENTO 4</b> (Continuación)						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
336	1159	1052	1014	1159	1089	1064
348	1159	1020	959	1159	1041	1010
360	1159	1066	1034	1159	1078	1050
372	1159	1054	1002	1159	1076	1042
384	1159	1076	1040	1159	969	988
396	1159	912	909	1159	1039	1043
408	1159	1120	1067	1159	1129	1094
420	1159	1129	1051	1159	1111	1089
432	1159	1108	1070	1159	1066	1046
444	1159	1095	1042	1159	1064	1041
456	1159	1084	1027	1159	1053	1025
468	1159	1039	1010	1159	1038	1005
480	1159	1085	1031	1159	1056	1048
492	1159	1079	1043	1159	1041	1031
504	1159	1083	1056	1159	1049	984
516	1159	1051	1034	1159	1030	1013
528	1159	1014	977	1159	1004	1007
540	1159	1023	969	1159	1003	977
552	1159	1225	1006	1159	1150	1120
564	1159	1227	1208	1159	1270	1250
576	1159	1132	1081	1159	1117	1112
588	1159	1081	1063	1159	1067	1042
600	1159	1055	997	1159	1061	1057
612	1159	1043	996	1159	1079	1045

# CONDUCTIVIDAD ( $\mu\text{S}/\text{cm}$ )

## EXPERIMENTO 5

TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1 <sup>a</sup> ETAPA	EFLUTE	AFLUTE	1 <sup>a</sup> ETAPA	EFLUTE
12	1159	1102	1099	1159	1156	1115
24	1159	955	911	1159	961	956
36	1159	905	880	1159	915	894
48	693	791	765	693	773	759
60	693	789	787	693	801	790
72	693	754	773	693	677	673
84	693	731	725	693	715	705
96	693	711	678	693	726	721
108	693	726	690	693	708	692
120	693	693	669	693	707	695
132	693	684	752	693	722	699
144	693	677	655	693	705	702
156	693	683	669	693	699	680
168	693	688	669	693	673	668
180	693	653	625	693	651	637
192	693	627	616	693	661	652
204	693	637	640	693	671	663
216	693	627	728	693	668	718
228	693	622	619	693	647	637
240	693	623	608	693	666	658
252	693	645	630	693	633	628
264	693	638	621	693	631	629
276	693	639	619	693	635	637
288	693	622	609	693	622	615
300	693	651	645	693	648	645
312	693	652	640	693	644	639
324	693	642	627	693	641	634
336	693	651	637	693	641	635
348	693	681	675	693	674	648

# CONDUCTIVIDAD ( $\mu\text{S/cm}$ )

## EXPERIMENTO 6

TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	693	801	771	693	781	779
24	693	740	764	693	730	
36	693	688	659	693	683	657
48	693	683	654	693	651	743
60	693	671	659	693	639	621
72	693	665	631	693	647	629
84	693	651	639	693	632	619
96	693	602	601	693	617	608
108	693	625	609	693	617	613
120	693	603	576	693	596	576
132	693	572	565	693	576	691
144	693	573	552	693	567	566
156	693	570	560	693	539	550
168	693	579	562	693	564	540
180	693	564	558	693	556	542
192	693	546	533	693	565	544
204	693	546	538	693	559	540
216	693	436	433	693	417	384
228	693	451	443	693	446	446
240	693	457	446	693	443	453
252	693	503	488	693	491	465
264	693	505	493	693	488	474
276	693	600	577	693	542	516
288	693	613	587	693	584	567
300	693	563	555	693	581	543
312	693	555	556	693	571	569



# CONDUCTIVIDAD ( $\mu\text{S/cm}$ )

<b>EXPERIMENTO 7</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	733	710	702	733	684	683
24	733	727	710	733	725	717
36	733	687	648	733	689	679
48	733	661	621	733	678	653
60	733	636	587	733	667	628
72	733	635	609	733	645	634
84	733	620	620	733	610	696
96	733	669	653	733	663	624
108	733	685	653	733	672	626
120	733	628	575	733	593	585
132	733	629	625	733	620	613
144	733	627	620	733	641	629
156	733	637	624	733	642	633
168	733	635	617	733	613	589
180	733	624	614	733	616	615
192	733	629	609	733	642	601
204	733	648	612	733	616	680
216	733	630	594	733	618	682

# CONDUCTIVIDAD ( $\mu\text{S}/\text{cm}$ )

<b>EXPERIMENTO 8</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	733	743	704	733	711	696
24	733	728	698	733	702	705
36	733	643	628	733	662	620
48	733	643	598	733	584	580
60	733	652	607	733	626	598
72	733	644	656	733	603	593
84	733	643	619	733	582	569
96	733	567	599	733	476	439
108	733	612	649	733	558	593
120	733	660	648	733	637	611
132	733	594	581	733	618	432
144	647	583	575	647	596	496
156	647	602	574	647	587	560
168	647	603	590	647	587	582
180	647	581	572	647	582	612
192	647	560	552	647	566	553
204	647	586	560	647	577	529
216	647	588	562	647	556	558
228	647	564	623	647	554	423
240	647	559	531	647	538	542
252	647	566	528	647	562	536
264	647	580	538	647	562	570

# CONDUCTIVIDAD ( $\mu\text{S/cm}$ )

<b>EXPERIMENTO 9</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	647	634	623	647	659	670
36	647	625	596	647	630	602
48	647	586	520	647	593	501
60	647	538	493	647	567	494
72	647	492	466	647	541	487
84	647	534	493	647	543	541
96	647	541	501	647	555	556
108	647	561	532	647	555	472
120	647	558	524	647	588	562
132	647	543	533	647	581	551
144	647	547	538	647	574	540
156	647	536	504	647	568	458
168	647	564	552	647	577	571
180	647	569	558	647	534	522
192	647	560	570	647	551	510
204	647	568	584	647	546	498
216	647	585	554	647	547	525
228	647	568	540	647	552	518
240	647	550	526	647	557	511
252	647	538	519	647	489	511
264	647	583	525	647	510	478

# pH

<b>EXPERIMENTO 1</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
24	7.00	7.03	7.85	7.00	7.25	7.33
48	7.00	7.49	7.98	7.00	7.51	7.87
72	7.00	7.64	8.15	7.00	7.80	8.00
96	7.00	7.63	7.93	7.00	7.81	7.79
120	7.00	7.77	8.09	7.00	7.82	7.87
144	7.00	7.21	7.78	7.00	7.38	7.90
168	7.00	7.60	7.85	7.00	7.89	7.90
192	7.00	7.80	7.90	7.00	7.96	7.98
216	7.00	7.50	7.86	7.00	8.01	8.11
240	7.00	7.37	7.63	7.00	7.63	7.75
264	7.00	7.25	7.39	7.00	7.25	7.39

# pH

<b>EXPERIMENTO 2</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
24	7.00	7.59	7.42	7.00	7.96	7.55
36	7.00	7.38	7.48	7.00	7.72	7.64
48	7.00	7.18	7.54	7.00	7.49	7.74
60	7.00	7.26	7.59	7.00	7.26	7.96
72	7.00	7.45	7.63	7.00	8.01	8.16
84	7.00	7.24	7.78	7.00	7.42	7.27
96	7.00	7.28	7.82	7.00	7.90	7.89
108	7.00	7.34	7.69	7.00	7.32	7.69
120	7.00	7.29	7.89	7.00	7.76	7.93
132	7.00	7.27	7.86	7.00	7.73	7.80
144	7.00	7.24	7.82	7.00	7.71	7.77
156	7.00	7.39	7.93	7.00	7.77	7.82
168	7.00	7.54	8.05	7.00	7.71	7.88
180	7.00	7.42	7.74	7.00	7.43	7.69
192	7.00	7.33	7.83	7.00	7.65	7.67
204	7.00	7.21	7.61	7.00	7.42	7.54
216	7.00	7.30	7.64	7.00	7.89	7.77
228	7.00	7.40	7.85	7.00	7.35	7.72
240	7.00	7.24	7.39	7.00	7.49	7.45

# pH

EXPERIMENTO 3						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	7.00	7.21	7.50	7.00	7.37	7.45
36	7.00	7.15	7.51	7.00	7.38	7.51
48	7.00	7.09	7.53	7.00	7.38	7.57
60	7.00	7.22	7.38	7.00	7.71	7.69
72	7.00	7.25	7.58	7.00	7.49	7.45
84	7.00	7.27	7.59	7.00	7.50	7.49
96	7.00	7.24	7.45	7.00	7.56	7.40
108	7.00	7.29	7.46	7.00	7.46	7.54
120	7.00	7.36	7.66	7.00	7.65	7.66
132	7.00	7.38	7.80	7.00	7.70	7.52
144	7.00	7.26	7.57	7.00	7.65	7.60
156	7.00	7.29	7.60	7.00	7.32	7.71
168	7.00	7.44	7.78	7.00	7.94	7.91
180	7.00	7.35	7.72	7.00	7.72	7.71
192	7.00	7.40	7.69	7.00	7.64	7.63
204	7.00	6.85	7.66	7.00	6.87	7.53

# pH

<b>EXPERIMENTO 4</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
12	7.00	7.13	7.24	7.00	7.36	7.39
24	7.00	7.19	7.04	7.00	7.22	7.44
36	7.00	7.19	7.35	7.00	7.76	7.85
48	7.00	7.11	7.30	7.00	7.35	7.30
60	7.00	6.21	7.16	7.00	7.02	7.38
72	7.00	7.17	7.43	7.00	7.11	7.47
84	7.00	7.23	7.38	7.00	7.09	7.39
96	7.00	6.60	7.42	7.00	7.40	7.41
108	7.00	6.83	7.34	7.00	7.38	7.35
120	7.00	7.12	7.34	7.00	7.13	7.36
132	7.00	6.80	7.20	7.00	7.27	7.39
144	7.00	6.24	7.05	7.00	7.14	7.21
156	7.00	6.60	7.01	7.00	7.06	7.15
168	7.00	6.89	7.05	7.00	7.16	7.42
180	7.00	6.77	7.02	7.00	7.04	7.41
192	7.00	6.81	6.88	7.00	7.23	7.20
204	7.00	6.91	6.91	7.00	7.19	7.16
216	7.00	6.87	6.98	7.00	6.94	7.40
228	7.00	6.91	7.25	7.00	6.75	6.79
240	7.00	6.81	7.03	7.00	7.18	7.23
252	7.00	6.39	6.98	7.00	7.21	7.33
264	7.00	6.62	6.87	7.00	6.95	7.23
276	7.00	6.86	6.77	7.00	6.45	7.01
288	7.00	6.49	7.01	7.00	7.24	7.33
300	7.00	6.83	6.94	7.00	7.08	7.21
312	7.00	6.66	6.93	7.00	6.36	7.20

# pH

<b>EXPERIMENTO 4</b> (Continuación)						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
324	7.00	7.00	6.97	7.00	7.13	7.26
336	7.00	7.30	7.01	7.00	6.86	7.00
348	7.00	6.93	7.06	7.00	7.13	7.24
360	7.00	6.68	7.04	7.00	6.96	7.09
372	7.00	7.10	7.06	7.00	7.10	6.98
384	7.00	6.95	7.05	7.00	7.41	7.35
396	7.00	7.71	7.65	7.00	7.02	7.22
408	7.00	7.10	7.05	7.00	6.67	7.20
420	7.00	7.09	6.94	7.00	6.91	7.22
432	7.00	6.41	7.16	7.00	7.03	7.21
444	7.00	6.97	7.19	7.00	7.23	7.33
456	7.00	7.08	7.05	7.00	7.15	7.27
468	7.00	6.64	7.13	7.00	7.04	7.22
480	7.00	6.71	7.18	7.00	7.12	7.23
492	7.00	7.15	7.16	7.00	7.09	7.22
504	7.00	6.50	7.11	7.00	6.98	7.34
516	7.00	6.19	7.21	7.00	6.62	7.20
528	7.00	7.14	7.24	7.00	7.01	7.22
540	7.00	6.94	7.37	7.00	7.11	7.21
552	7.00	6.63	7.22	7.00	6.95	7.20
564	7.00	6.33	7.06	7.00	6.88	7.20
576	7.00	6.73	7.01	7.00	6.98	7.08
588	7.00	6.75	7.05	7.00	6.35	6.97
600	7.00	6.97	7.03	7.00	7.06	7.16
612	7.00	6.92	6.95	7.00	6.98	7.19



pH

<b>EXPERIMENTO 5</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	7.00	7.41	7.51	7.00	7.51	7.58
24	7.00	7.04	7.30	7.00	7.11	7.07
36	7.00	6.49	7.06	7.00	6.90	7.09
48	7.00	6.78	7.07	7.00	7.26	7.20
60	7.00	6.95	7.32	7.00	7.23	7.37
72	7.00	7.58	7.53	7.00	7.45	7.40
84	7.00	6.88	7.25	7.00	7.10	7.27
96	7.00	6.94	7.26	7.00	7.35	7.37
108	7.00	6.67	6.88	7.00	6.95	7.17
120	7.00	6.12	6.99	7.00	7.24	7.23
132	7.00	6.10	6.94	7.00	7.23	7.20
144	7.00	6.08	6.89	7.00	7.22	7.17
156	7.00	6.48	6.91	7.00	7.04	7.22
168	7.00	6.93	7.00	7.00	7.06	7.07
180	7.00	6.20	7.04	7.00	6.97	7.20
192	7.00	6.02	6.98	7.00	6.99	7.19
204	7.00	6.97	7.04	7.00	7.01	7.17
216	7.00	6.45	7.09	7.00	7.29	7.00
228	7.00	6.75	7.06	7.00	6.82	7.06
240	7.00	6.42	7.00	7.00	7.03	7.08
252	7.00	6.06	6.94	7.00	6.80	7.03
264	7.00	6.61	7.18	7.00	7.14	7.22
276	7.00	6.54	7.04	7.00	7.08	7.12
288	7.00	6.59	6.70	7.00	6.59	6.80
300	7.00	6.39	6.91	7.00	6.93	6.98
312	7.00	6.30	6.70	7.00	7.03	7.07
324	7.00	6.75	7.02	7.00	7.13	7.15
336	7.00	6.26	7.70	7.00	6.80	7.04
348	7.00	6.60	6.69	7.00	6.57	6.95

# pH

<b>EXPERIMENTO 6</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
12	7.00	7.23	7.33	7.00	7.38	7.45
24	7.00	6.96	6.96	7.00	7.16	7.25
36	7.00	6.72	6.79	7.00	6.91	7.01
48	7.00	6.77	6.85	7.00	6.93	6.99
60	7.00	6.63	6.86	7.00	6.80	6.96
72	7.00	6.65	6.80	7.00	6.85	7.00
84	7.00	6.60	7.10	7.00	6.93	7.08
96	7.00	6.93	7.20	7.00	7.01	7.15
108	7.00	6.85	7.15	7.00	6.90	7.08
120	7.00	7.04	7.21	7.00	7.12	7.09
132	7.00	6.57	7.07	7.00	6.99	7.15
144	7.00	6.98	7.20	7.00	7.12	7.10
156	7.00	6.87	7.09	7.00	7.20	7.19
168	7.00	6.78	7.03	7.00	6.97	7.08
180	7.00	6.86	7.14	7.00	7.02	7.17
192	7.00	6.92	7.34	7.00	6.90	7.09
204	7.00	6.98	7.45	7.00	6.78	7.16
216	7.00	6.95	7.21	7.00	7.27	7.55
228	7.00	6.89	7.28	7.00	7.09	7.21
240	7.00	6.87	7.28	7.00	7.09	7.25
252	7.00	6.90	7.29	7.00	7.09	7.16
264	7.00	6.66	7.00	7.00	6.93	7.01
276	7.00	6.60	7.02	7.00	6.88	6.98
288	7.00	6.22	6.77	7.00	6.80	6.95
300	7.00	6.91	7.36	7.00	7.01	7.11
312	7.00	6.48	6.82	7.00	6.88	6.89

# pH

<b>EXPERIMENTO 7</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
12	7.00	7.27	7.52	7.00	7.41	7.37
24	7.00	7.19	7.14	7.00	7.20	7.18
36	7.00	6.39	6.41	7.00	6.46	6.42
48	7.00	6.23	6.2	7.00	6.2	6.39
60	7.00	6.17	6.04	7.00	6.06	6.37
72	7.00	6.03	6.12	7.00	5.42	5.53
84	7.00	6.12	6.20	7.00	5.29	5.24
96	7.00	6.05	6.19	7.00	6.83	6.54
108	7.00	5.84	6.24	7.00	6.18	6.63
120	7.00	6.10	6.33	7.00	6.06	6.53
132	7.00	5.88	6.68	7.00	6.46	6.49
144	7.00	6.27	6.88	7.00	6.70	6.92
156	7.00	6.24	6.65	7.00	6.53	7.07
168	7.00	5.85	6.10	7.00	6.17	6.36
180	7.00	6.25	6.78	7.00	6.81	6.80
192	7.00	6.09	6.60	7.00	6.56	6.76
204	7.00	6.06	6.54	7.00	6.27	6.31
216	7.00	6.34	6.81	7.00	6.35	6.40

# pH

<b>EXPERIMENTO 8</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
12	7.00	7.32	7.36	7.00	7.26	7.22
24	7.00	6.99	6.99	7.00	7.05	7.06
36	7.00	6.51	6.44	7.00	6.80	6.67
48	7.00	6.17	5.91	7.00	6.06	6.04
60	7.00	6.33	6.46	7.00	6.44	6.49
72	7.00	6.31	6.55	7.00	6.70	6.72
84	7.00	6.28	6.62	7.00	6.72	6.89
96	7.00	6.81	6.55	7.00	7.28	7.36
108	7.00	6.05	6.18	7.00	6.58	6.64
120	7.00	5.75	6.00	7.00	6.30	6.50
132	7.00	6.28	6.61	7.00	6.45	6.91
144	7.00	6.27	6.64	7.00	6.45	6.76
156	7.00	5.94	6.21	7.00	6.46	6.72
168	7.00	6.25	6.56	7.00	6.71	6.74
180	7.00	6.06	6.56	7.00	6.60	6.94
192	7.00	6.15	6.66	7.00	6.97	7.17
204	7.00	6.36	6.71	7.00	6.75	6.90
216	7.00	6.25	6.90	7.00	6.87	6.97
228	7.00	6.48	7.04	7.00	6.73	7.05
240	7.00	6.47	7.01	7.00	6.68	6.81
252	7.00	6.52	7.05	7.00	6.75	7.02
264	7.00	6.15	6.95	7.00	6.48	6.80

# pH

EXPERIMENTO 9						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	7.00	7.35	7.44	7.00	7.30	7.33
36	7.00	7.19	7.14	7.00	6.96	6.86
48	7.00	6.85	6.72	7.00	6.67	6.57
60	7.00	6.82	6.8	7.00	6.64	6.6
72	7.00	6.80	6.87	7.00	6.62	6.64
84	7.00	6.50	6.53	7.00	6.66	6.63
96	7.00	6.62	6.87	7.00	6.88	7.07
108	7.00	6.43	6.72	7.00	6.54	6.80
120	7.00	6.43	6.87	7.00	6.76	6.92
132	7.00	6.62	6.93	7.00	6.77	6.93
144	7.00	6.37	6.84	7.00	6.78	6.93
156	7.00	6.72	7.19	7.00	6.86	6.96
168	7.00	6.56	7.03	7.00	6.87	7.03
180	7.00	6.48	6.96	7.00	6.82	6.70
192	7.00	6.59	7.30	7.00	6.85	6.88
204	7.00	6.44	7.03	7.00	6.87	7.05
216	7.00	6.37	7.01	7.00	6.65	6.86
228	7.00	6.54	7.14	7.00	6.57	6.72
240	7.00	6.61	7.29	7.00	6.49	6.58
252	7.00	6.53	7.02	7.00	6.42	6.44
264	7.00	6.63	7.10	7.00	6.53	6.77

## NH<sub>4</sub> (ppm.N)

<b>EXPERIMENTO 1</b>						
<b>TIEMPO Horas</b>	<b>CONTROL</b>			<b>ALTERNA</b>		
	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>1ª ETAPA</b>	<b>EFLUTE</b>
24	10.80	8.80	8.25	10.80	8.00	7.37
48	10.80	6.50	7.40	10.80	7.05	6.95
72	10.80	4.50	2.85	10.80	3.60	1.90
96	10.80	7.80	7.70	10.80	6.70	6.15
120	10.80	7.50	7.53	10.80	7.13	5.92
144	10.80	7.20	7.35	10.80	7.56	5.70
168	10.80	6.90	6.80	10.80	8.00	7.20
192	10.80	8.70	7.60	10.80	3.80	2.20
216	10.80	9.20	8.30	10.80	2.20	1.60
240	10.80	9.20	8.30	10.80	2.20	1.60
264	10.80	9.20	8.30	10.80	2.20	1.60

## NH<sub>4</sub> (ppm.N)

<b>EXPERIMENTO 2</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	10.80	1.10	1.00	10.80	6.10	5.50
24	10.80	7.80	5.80	10.80	6.20	5.50
36	10.80	8.60	7.10	10.80	4.50	4.30
48	10.80	6.60	6.60	10.80	4.50	3.70
60	10.80	9.00	6.80	10.80	5.20	4.50
72	10.80	7.70	7.50	10.80	4.30	2.80
84	10.80	7.70	7.50	10.80	8.00	6.30
96	10.80	7.60	7.10	10.80	10.80	9.80
108	10.80	5.73	9.68	10.80	4.40	8.03
120	10.80	6.50	6.40	10.80	5.15	6.33
132	10.80	6.40	6.40	10.80	5.90	4.60
144	10.80	8.20	6.50	10.80	7.00	6.80
156	10.80	4.35	4.32	10.80	6.96	6.49
168	10.80	5.28	5.06	10.80	6.07	7.78
180	10.80	6.22	5.81	10.80	7.01	7.28
192	10.80	7.16	6.55	10.80	7.95	6.79
204	10.80	8.10	7.30	10.80	8.90	6.30
216	10.80	9.50	9.00	10.80	7.10	6.75
228	10.80	8.71	5.87	10.80	5.30	7.19
240	10.80	7.19	7.19	10.80	5.60	7.95

## NH<sub>4</sub> (ppm.N)

EXPERIMENTO 3						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1 <sup>a</sup> ETAPA	EFLUTE	AFLUTE	1 <sup>a</sup> ETAPA	EFLUTE
24	10.80	6.40	5.20	10.80	7.10	4.80
36	10.80	8.20	6.90	10.80	7.10	6.90
48	10.80	7.79	6.78	10.80	7.30	6.78
60	10.80	7.38	6.66	10.80	7.50	6.66
72	10.80	7.50	6.80	10.80	6.40	5.50
84	10.80	7.60	6.70	10.80	7.00	6.60
96	10.80	10.20	6.90	10.80	6.60	6.10
108	10.80	10.80	5.80	10.80	7.60	5.40
120	10.80	5.14	3.75	10.80	4.48	4.11
132	10.80	5.42	4.53	10.80	4.89	4.41
144	10.80	5.70	5.30	10.80	5.30	4.70
156	10.80	6.80	6.50	10.80	5.70	4.50
168	10.80	7.90	7.60	10.80	7.00	4.50
180	10.80	10.40	9.90	10.80	4.50	3.60
192	10.80	6.50	6.00	10.80	5.80	5.00
204	10.80	9.20	7.50	10.80	7.10	6.90



# NH<sub>4</sub> (ppm.N)

<b>EXPERIMENTO 4</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	21.60	11.30	8.00	21.60	11.80	9.50
24	21.60	10.75	7.60	21.60	11.93	10.23
36	21.60	10.20	7.20	21.60	12.06	10.96
48	21.60	12.70	9.70	21.60	12.20	11.70
60	21.60	12.00	9.20	21.60	12.00	10.80
72	21.60	11.23	8.69	21.60	10.87	9.78
84	21.60	13.77	10.14	21.60	10.14	7.97
96	21.60	9.94	7.49	21.60	9.17	7.80
108	21.60	12.38	7.64	21.60	9.78	9.02
120	21.60	10.88	5.64	21.60	9.67	9.67
132	21.60	12.10	7.66	21.60	14.11	12.90
144	21.60	11.62	6.53	21.60	13.32	11.78
156	21.60	10.89	5.47	21.60	12.54	10.66
168	21.60	10.29	4.41	21.60	11.76	9.55
180	21.60	17.65	6.76	21.60	11.03	8.09
192	21.60	15.32	5.64	21.60	13.71	13.31
204	21.60	20.97	6.45	21.60	14.52	14.11
216	21.60	13.70	6.00	21.60	12.10	11.20
228	21.60	17.70	6.40	21.60	12.50	10.90
240	21.60	13.50	5.70	21.60	13.10	12.70
252	21.60	11.90	6.50	21.60	8.60	7.80
264	21.60	13.12	7.66	21.60	12.87	7.35
276	21.60	14.34	8.82	21.60	14.33	9.19
288	21.60	13.93	7.38	21.60	13.93	10.65
300	21.60	13.11	8.20	21.60	18.03	16.39
312	21.60	13.46	8.65	21.60	11.53	11.53

# NH<sub>4</sub> (ppm. N)

<b>EXPERIMENTO 4</b> (Continuación)						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
324	21.60	11.54	5.29	21.60	13.94	12.50
336	21.60	8.67	3.53	21.60	8.01	4.41
348	21.60	12.28	6.03	21.60	11.40	5.15
360	21.60	11.66	7.08	21.60	13.33	9.99
372	21.60	14.17	10.00	21.60	7.33	7.50
384	21.60	9.72	6.94	21.60	1.32	0.92
396	21.60	9.94	5.62	21.60	6.94	6.94
408	21.60	10.16	4.30	21.60	10.93	8.59
420	21.60	14.45	10.55	21.60	14.84	9.37
432	21.60	13.94	9.13	21.60	11.06	8.17
444	21.60	16.35	5.29	21.60	8.17	6.25
456	21.60	11.29	3.41	21.60	7.58	5.33
468	21.60	6.25	2.94	21.60	6.98	4.41
480	21.60	8.75	4.58	21.60	7.50	7.50
492	21.60	11.25	5.00	21.60	9.58	9.17
504	21.60	10.42	5.83	21.60	2.08	7.92
516	21.60	7.50	2.08	21.60	7.90	6.67
528	21.60	9.58	3.47	21.60	6.60	5.07
540	21.60	9.58	6.94	21.60	13.19	9.86
552	21.60	9.25	5.70	21.60	11.95	10.06
564	21.60	8.92	4.46	21.60	10.71	10.26
576	21.60	5.55	5.09	21.60	7.40	6.09
588	21.60	10.18	6.09	21.60	6.02	6.02
600	21.60	7.76	4.31	21.60	12.07	9.91
624	21.60	12.93	4.31	21.60	16.38	15.95

# NH<sub>4</sub> (ppm.N)

EXPERIMENTO 5						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	21.60	19.39	17.06	21.60	21.60	21.55
24	21.60	17.67	12.67	21.60	18.27	12.50
36	21.60	10.59	8.47	21.60	10.17	9.32
48	21.60	8.47	8.05	21.60	9.32	7.63
60	21.60	11.45	8.64	21.60	13.61	11.58
72	21.60	10.91	9.14	21.60	10.14	9.16
84	21.60	10.36	9.64	21.60	10.71	10.36
96	21.60	10.71	10.57	21.60	17.73	14.43
108	21.60	8.93	6.69	21.60	7.14	5.80
120	21.60	7.14	4.90	21.60	13.39	10.26
132	21.60	8.00	7.00	21.60	15.59	13.88
144	21.60	14.80	8.70	21.60	17.80	17.50
156	21.60	8.75	7.92	21.60	15.80	9.17
168	21.60	10.83	9.17	21.60	12.08	12.05
180	21.60	6.48	5.55	21.60	10.65	8.33
192	21.60	10.18	8.33	21.60	10.61	7.53
204	21.60	4.80	4.33	21.60	10.58	6.73
216	21.60	5.94	4.91	21.60	10.69	8.19
228	21.60	7.09	5.49	21.60	10.81	9.66
240	21.60	10.81	8.68	21.60	15.96	13.30
252	21.60	5.70	5.48	21.60	5.70	5.48
264	21.60	9.87	8.22	21.60	15.57	13.94
276	21.60	13.15	11.96	21.60	18.14	15.54
288	21.60	16.43	15.71	21.60	20.71	17.14
300	21.60	14.02	4.88	21.60	8.54	6.09
312	21.60	17.33	10.86	21.60	13.23	10.65
324	21.60	20.65	16.84	21.60	17.93	15.21
336	21.60	9.24	16.58	21.60	11.41	15.26
348	21.60	12.76	16.33	21.60	18.89	15.31

# NH<sub>4</sub> (ppm.N)

EXPERIMENTO 6						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	21.60	21.60	17.34	21.60	21.60	21.55
24	21.60	8.15	6.32	21.60	20.84	6.32
36	21.60	8.90	7.33	21.60	17.19	6.29
48	21.60	9.66	8.35	21.60	13.54	6.27
60	21.60	10.42	9.37	21.60	9.90	6.25
72	21.60	17.39	13.04	21.60	7.07	6.25
84	21.60	20.11	14.13	21.60	11.20	6.25
96	21.60	10.79	7.38	21.60	15.34	6.25
108	21.60	17.61	15.34	21.60	14.20	11.36
120	21.60	18.23	18.23	21.60	18.75	4.69
132	21.60	16.15	14.58	21.60	10.42	9.89
144	21.60	5.00	4.16	21.60	5.83	3.33
156	21.60	16.60	15.00	21.60	6.86	19.60
168	21.60	7.40	13.63	21.60	7.90	6.80
180	21.60	10.70	12.26	21.60	14.80	11.30
192	21.60	14.00	10.90	21.60	13.65	12.50
204	21.60	14.80	14.10	21.60	12.50	12.50
216	21.60	11.06	10.24	21.60	9.98	9.68
228	21.60	7.32	6.38	21.60	7.47	6.86
240	21.60	3.59	2.52	21.60	4.96	4.04
252	21.60	4.88	3.91	21.60	5.82	0.00
264	21.60	6.16	5.30	21.60	6.16	5.99
276	21.60	11.90	9.52	21.60	10.71	8.33
288	21.60	17.26	10.12	21.60	13.09	4.76
300	21.60	12.70	12.30	21.60	15.50	10.90
312	21.60	10.40	9.40	21.60	13.90	9.70

# NH4 (ppm.N)

EXPERIMENTO 7						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	32.40	30.00	28.40	32.40	32.30	28.00
24	32.40	28.12	25.15	32.40	28.90	26.17
36	32.40	26.56	21.09	32.40	32.40	25.78
48	32.40	20.62	15.03	32.40	24.80	17.49
60	32.40	14.68	8.98	32.40	16.01	9.21
72	32.40	14.77	11.70	32.40	16.14	10.90
84	32.40	24.50	18.18	32.40	29.54	23.63
96	32.40	18.03	17.06	32.40	29.19	25.03
108	32.40	15.80	14.60	32.40	28.85	26.44
120	32.40	13.57	12.14	32.40	14.64	12.86
132	32.40	17.50	15.71	32.40	16.43	16.43
144	32.40	14.77	7.47	32.40	13.57	14.22
156	32.40	19.67	8.63	32.40	19.67	12.01
168	32.40	12.00	9.80	32.40	19.18	9.80
180	32.40	17.00	16.50	32.40	18.70	16.50
192	32.40	12.50	8.33	32.40	9.37	8.23
204	32.40	18.75	16.66	32.40	17.70	10.23
216	32.40	21.43	16.96	32.40	17.70	10.23

NH<sub>4</sub> (ppm.N)

<b>EXPERIMENTO 8</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
12	32.40	28.45	28.44	32.40	28.45	22.41
24	32.40	19.00	12.00	32.40	29.31	12.07
36	32.40	10.29	8.45	32.40	10.26	8.45
48	32.40	11.76	7.35	32.40	10.66	7.72
60	32.40	16.28	12.73	32.40	14.50	12.41
72	32.40	20.81	18.12	32.40	18.34	17.11
84	32.40	12.02	12.50	32.40	18.30	12.88
96	32.40	25.96	17.30	32.40	18.27	8.65
108	32.40	17.90	17.08	32.40	18.75	10.00
120	32.40	25.00	16.66	32.40	18.75	18.33
132	32.40	15.62	14.84	32.40	17.97	7.81
144	32.40	10.16	9.38	32.40	15.30	8.69
156	32.40	10.42	10.76	32.40	12.64	9.58
168	32.40	15.28	14.24	32.40	16.67	15.97
180	32.40	15.90	15.15	32.40	19.32	18.56
192	32.40	18.43	15.64	32.40	20.45	13.64
204	32.40	20.97	16.13	32.40	21.51	16.09
216	32.40	22.19	20.97	32.40	22.58	18.55
228	32.40	13.31	8.06	32.40	16.53	7.66
240	32.40	19.35	14.52	32.40	19.35	10.48
252	32.40	21.67	15.83	32.40	20.00	12.50
264	32.40	19.17	15.83	32.40	22.91	16.67

## NH<sub>4</sub> (ppm.N)

<b>EXPERIMENTO 9</b>						
TIEMPO Horas	CONTROL			ALTERNA		
	AFLUTE	1ª ETAPA	EFLUTE	AFLUTE	1ª ETAPA	EFLUTE
24	32.40	31.46	30.60	32.40	32.29	14.58
36	32.40	20.83	10.94	32.40	32.29	14.58
48	32.40	23.44	16.67	32.40	21.87	13.54
60	32.40	19.63	14.48	32.40	21.35	16.04
72	32.40	15.83	12.29	32.40	20.83	18.54
84	32.40	13.97	9.55	32.40	10.66	10.29
96	32.40	16.54	13.23	32.40	18.75	14.70
108	32.40	8.65	5.77	32.40	8.65	7.69
120	32.40	19.23	18.27	32.40	25.48	17.30
132	32.40	17.86	6.69	32.40	20.33	15.79
144	32.40	12.95	12.05	32.40	15.18	14.28
156	32.40	14.06	7.03	32.40	17.19	16.02
168	32.40	14.06	15.63	32.40	21.88	17.97
180	32.40	17.86	14.88	32.40	18.97	13.74
192	32.40	17.86	15.48	32.40	16.07	9.52
204	32.40	21.74	21.74	32.40	25.00	9.78
216	32.40	26.40	23.35	32.40	28.83	16.32
228	32.40	22.82	21.30	32.40	24.41	17.82
240	32.40	19.25	19.25	32.40	20.00	19.33
252	32.40	18.98	17.13	32.40	20.37	12.96
264	32.40	25.00	22.63	32.40	21.29	15.28

NO<sub>2</sub> (ppm.N)

<b>EXPERIMENTO 1</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	0.000	0.015	0.000	0.017
48	0.000	0.028	0.000	0.028
72	0.000	0.028	0.000	0.020
96	0.000	0.028	0.000	0.012
120	0.000	0.032	0.000	0.015
144	0.000	0.036	0.000	0.018
168	0.000	0.028	0.000	0.024
192	0.000	0.024	0.000	0.015
216	0.000	0.020	0.000	0.005
240	0.000	0.020	0.000	0.005
264	0.000	0.020	0.000	0.005



## NO<sub>2</sub> (ppm.N)

<b>EXPERIMENTO 2</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	0.000	0.012	0.000	0.016
48	0.000	0.024	0.000	0.015
72	0.000	0.028	0.000	0.008
96	0.000	0.035	0.000	0.209
120	0.000	0.042	0.000	0.050
144	0.000	0.138	0.000	0.046
168	0.000	0.187	0.000	0.078
192	0.000	0.092	0.000	0.070
216	0.000	0.048	0.000	0.061
240	0.000	0.048	0.000	0.061

## NO2 (ppm.N)

<b>EXPERIMENTO 3</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	0.000	0.068	0.000	0.091
48	0.000	0.096	0.000	0.108
72	0.000	0.126	0.000	0.162
96	0.000	0.172	0.000	0.206
120	0.000	0.660	0.000	0.272
144	0.000	0.287	0.000	0.338
168	0.000	0.548	0.000	0.536
192	0.000	0.418	0.000	0.366

# NO<sub>2</sub> (ppm.N)

## EXPERIMENTO 4

TIEMPO Horas	CONTROL		ALTERNA	
	AFLUTE	EFLUTE	AFLUTE	EFLUTE
12	0.000	0.340	0.000	0.080
36	0.000	0.340	0.000	0.305
60	0.000	1.960	0.000	0.589
84	0.000	2.610	0.000	1.850
108	0.000	3.500	0.000	0.920
132	0.000	0.522	0.000	0.224
156	0.000	3.404	0.000	0.698
180	0.000	7.330	0.000	1.620
204	0.000	6.410	0.000	1.150
228	0.000	6.020	0.000	2.240
252	0.000	4.440	0.000	3.220
276	0.000	4.600	0.000	4.200
300	0.000	3.076	0.000	2.290
324	0.000	4.850	0.000	4.250
348	0.000	4.250	0.000	5.150
372	0.000	4.450	0.000	6.800
396	0.000	4.950	0.000	2.420
420	0.000	5.450	0.000	6.950
444	0.000	4.300	0.000	3.250
468	0.000	4.780	0.000	3.730
492	0.000	3.730	0.000	2.750
516	0.000	4.510	0.000	3.270
540	0.000	4.320	0.000	4.120
564	0.000	5.100	0.000	3.400
588	0.000	4.675	0.000	3.725
624	0.000	4.250	0.000	4.050

**N02** (ppm.N)

<b>EXPERIMENTO 5</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	0.000	0.175	0.000	0.085
48	0.000	0.195	0.000	0.327
72	0.000	0.213	0.000	0.817
96	0.000	0.230	0.000	0.730
120	0.000	0.150	0.000	0.550
144	0.000	0.026	0.000	0.209
168	0.000	0.169	0.000	0.261
192	0.000	0.222	0.000	0.418
216	0.000	0.390	0.000	0.575
240	0.000	0.558	0.000	0.732
264	0.000	0.555	0.000	0.536
288	0.000	0.615	0.000	0.550
312	0.000	0.635	0.000	0.537
336	0.000	0.654	0.000	0.523
348	0.000	1.270	0.000	0.785

## NO<sub>2</sub> (ppm.N)

<b>EXPERIMENTO 6</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
12	0.000	0.157	0.000	0.183
36	0.000	0.096	0.000	0.123
60	0.000	0.035	0.000	0.063
84	0.000	0.038	0.000	0.061
108	0.000	0.063	0.000	0.059
132	0.000	0.071	0.000	0.062
156	0.000	0.083	0.000	0.067
180	0.000	0.084	0.000	0.075
204	0.000	0.086	0.000	0.065
228	0.000	0.037	0.000	0.012
252	0.000	0.084	0.000	0.063
276	0.000	0.034	0.000	0.109
300	0.000	0.083	0.000	0.127

NO<sub>2</sub> (ppm.N)

<b>EXPERIMENTO 7</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
12	0.000	0.031	0.000	0.039
36	0.000	0.014	0.000	0.015
60	0.000	0.013	0.000	0.009
84	0.000	0.009	0.000	0.005
108	0.000	0.016	0.000	0.015
132	0.000	0.023	0.000	0.027
156	0.000	0.044	0.000	0.020
180	0.000	0.053	0.000	0.031
204	0.000	0.065	0.000	0.017

## NO<sub>2</sub> (ppm.N)

<b>EXPERIMENTO 8</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	0.000	0.021	0.000	0.045
48	0.000	0.018	0.000	0.017
72	0.000	0.010	0.000	0.018
96	0.000	0.013	0.000	0.136
120	0.000	0.018	0.000	0.029
144	0.000	0.037	0.000	0.032
168	0.000	0.048	0.000	0.034
192	0.000	0.045	0.000	0.025
216	0.000	0.041	0.000	0.027
240	0.000	0.033	0.000	0.023
264	0.000	0.011	0.000	0.025

**NO<sub>2</sub>** (ppm.N)

<b>EXPERIMENTO 9</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	0.000	0.031	0.000	0.020
48	0.000	0.040	0.000	0.029
72	0.000	0.051	0.000	0.050
96	0.000	0.022	0.000	0.024
120	0.000	0.016	0.000	0.029
144	0.000	0.015	0.000	0.033
168	0.000	0.015	0.000	0.016
192	0.000	0.015	0.000	0.018
216	0.000	0.014	0.000	0.020
240	0.000	0.014	0.000	0.071
264	0.000	0.016	0.000	0.010



# NO3 (ppm.N)

<b>EXPERIMENTO 1</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	1.000	1.000	1.000	1.000
48	1.000	1.000	1.000	1.000
72	1.000	1.000	1.000	1.000
96	1.000	1.000	1.100	1.100
120	1.000	1.000	0.950	0.950
144	1.000	1.000	0.800	0.800
168	1.000	1.100	0.900	0.900
192	1.000	1.025	0.900	0.900
216	1.000	0.950	0.900	0.900
240	1.000	0.950	0.900	0.900
264	1.000	0.950	0.900	0.900

## NO3 (ppm.N)

<b>EXPERIMENTO 2</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	1.000	0.900	1.000	1.000
48	1.000	0.850	0.935	0.935
72	1.000	0.815	0.915	0.915
96	1.000	0.830	0.860	0.860
120	1.000	0.865	0.880	0.880
144	1.000	0.850	0.900	0.900
168	1.000	0.830	0.915	0.915
192	1.000	0.860	0.923	0.923
216	1.000	0.860	0.908	0.908
240	1.065	0.810	0.865	0.865

# NO<sub>3</sub> (ppm.N)

<b>EXPERIMENTO 3</b>				
TIEMPO Horas	CONTROL		ALTERNA	
	AFLUTE	EFLUTE	AFLUTE	EFLUTE
24	1.400	0.930	0.960	0.960
48	1.360	0.700	1.960	1.960
72	1.300	0.900	0.960	0.960
96	1.150	0.750	0.900	0.900
120	1.738	1.625	1.450	1.450
144	2.400	2.500	2.000	2.000
168	1.850	1.650	1.465	1.465
192	1.300	0.800	0.930	0.930

# NO3 (ppm.N)

<b>EXPERIMENTO 4</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
12	1.100	0.830	0.760	0.760
36	1.170	1.050	0.890	0.890
60	1.240	0.000	1.020	1.020
84	1.600	0.970	0.000	0.000
108	1.000	0.870	0.870	0.870
132	1.130	1.220	1.130	1.130
156	1.440	1.285	1.105	1.105
180	1.750	1.350	1.080	1.080
204	1.280	1.180	0.820	0.820
228	1.250	1.100	0.860	0.860
252	1.200	1.350	1.350	1.350
276	1.300	1.030	1.000	1.000
300	1.300	1.300	0.200	0.200
324	1.520	0.750	0.700	0.700
348	1.000	0.970	0.930	0.930
372	1.370	1.250	1.380	1.380
396	1.000	0.680	0.700	0.700
420	1.000	0.900	0.980	0.980
444	1.000	0.800	0.750	0.750
468	1.000	0.800	0.800	0.800
492	1.000	0.820	0.780	0.780
516	1.000	0.700	0.720	0.720
540	0.900	0.700	0.830	0.830
564	1.120	0.800	0.780	0.780
588	1.120	0.780	0.780	0.780
624	1.240	0.700	0.720	0.720

# NO3 (ppm.N)

<b>EXPERIMENTO 5</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	1.280	0.530	0.500	0.500
48	1.280	0.530	0.500	0.500
72	1.200	0.515	0.500	0.500
96	1.120	0.500	0.500	0.500
120	1.070	0.500	0.500	0.500
144	1.020	0.500	0.500	0.500
168	1.080	0.500	0.500	0.500
192	1.000	0.500	0.980	0.980
216	0.960	0.500	0.740	0.740
240	0.920	0.500	0.500	0.500
264	0.700	0.500	0.500	0.500
288	0.870	0.500	0.500	0.500
312	0.845	0.430	0.435	0.435
336	0.820	0.360	0.370	0.370
348	0.800	0.400	0.385	0.385

NO3 (ppm.N)

<b>EXPERIMENTO 6</b>				
TIEMPO Horas	CONTROL		ALTERNA	
	AFLUTE	EFLUTE	AFLUTE	EFLUTE
12	1.000	0.870	0.900	0.900
36	1.045	0.645	0.655	0.655
60	1.090	0.420	0.410	0.410
84	0.750	0.300	0.310	0.310
108	0.680	0.375	0.410	0.410
132	0.900	0.380	0.600	0.600
156	0.900	0.401	0.420	0.420
180	0.960	0.601	0.600	0.600
204	0.960	0.750	0.750	0.750
228	0.900	0.330	0.300	0.300
252	0.900	0.300	0.500	0.500
276	1.100	0.300	0.600	0.600
300	0.900	0.430	0.500	0.500

## NO3 (ppm.N)

<b>EXPERIMENTO 7</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
12	1.000	0.930	0.960	0.960
36	0.800	0.470	0.530	0.530
60	0.800	0.400	0.390	0.390
84	0.800	0.480	0.600	0.600
108	0.510	0.400	0.430	0.430
132	0.700	0.380	0.400	0.400
156	0.700	0.450	0.420	0.420
180	0.900	0.400	0.400	0.400
204	0.750	0.430	0.400	0.400

NO3 (ppm.N)

<b>EXPERIMENTO 8</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	0.800	0.780	0.700	0.700
48	0.800	0.350	0.350	0.350
72	0.750	0.400	0.450	0.450
96	0.800	0.370	0.380	0.380
120	0.800	0.370	0.390	0.390
144	0.800	0.360	0.780	0.780
168	0.600	0.300	0.300	0.300
192	0.990	0.310	0.440	0.440
216	1.100	0.320	0.300	0.300
240	1.170	0.340	0.350	0.350
264	1.100	0.400	0.440	0.440



NO3 (ppm. N)

<b>EXPERIMENTO 9</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>AFLUTE</b>	<b>EFLUTE</b>	<b>AFLUTE</b>	<b>EFLUTE</b>
24	1.350	0.450	0.400	0.400
48	1.200	0.500	0.410	0.410
72	1.550	0.440	0.380	0.380
96	1.800	0.270	0.300	0.300
120	1.700	0.240	0.240	0.240
144	2.000	0.300	0.400	0.400
168	1.600	0.380	0.370	0.370
192	1.550	0.360	0.340	0.340
216	1.500	0.340	0.310	0.310
240	1.100	0.250	0.250	0.250
264	1.300	0.400	0.250	0.250

OD (ppm)

<b>EXPERIMENTO 1</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
36				
48	3.9	7.1	6.8	5.6
72	5.0	7.3	6.1	7.1
96	5.0	7.8	7.2	6.2
120	4.0	7.0	7.1	5.4
144	3.4	6.8	5.1	6.4
168	3.4	6.2	6.5	4.7
192	4.4	6.9	5.4	6.3
216	3.2	6.2	6.2	5.6
240	3.1	6.3	6.1	5.5
264	5.4	6.4	5.5	6.1

OD (ppm)

<b>EXPERIMENTO 2</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
24	5.3	5.8	5.8	6.1
36	5.0	5.6	6.0	5.6
48	4.3	5.4	5.8	5.5
60	4.4	5.6	5.9	6.2
72	4.7	5.8	6.3	6.6
84	4.2	6.1	5.8	6.6
96	4.4	5.5	5.2	4.9
108	4.5	5.3	4.9	5.5
120	4.6	6.3	6.0	5.1
144	4.3	6.1	4.6	5.8
156	4.1	6.0	5.6	4.2
168	4.5	6.3	4.7	5.4
180	4.9	6.1	5.5	4.0
192	4.7	6.4	5.4	6.2
204	4.5	5.7	5.5	3.9
216	3.5	5.6	4.1	5.4
228	4.2	5.8	5.9	6.1
240	3.9	5.0	4.1	5.8
252	3.8	5.2	5.1	3.0

OD (ppm)

<b>EXPERIMENTO 3</b>				
TIEMPO Horas	CONTROL		ALTERNA	
	1ª ETAPA	2ª ETAPA	1ª ETAPA	2ª ETAPA
24	3.6	4.3	3.9	3.1
36	3.6	4.4	3.2	4.0
48	3.6	4.5	4.1	3.4
60	3.7	4.6	4.4	4.7
72	3.7	4.1	4.3	3.3
84	4.2	5.8	5.2	4.0
96	3.9	5.0	4.3	3.6
108	4.1	5.4	4.9	3.1
120	4.3	5.6	5.0	3.6
132	4.3	5.2	4.8	4.2
144	3.5	4.6	4.4	3.8
156	3.2	4.8	4.3	3.7
168	2.7	3.5	3.1	2.5
180	3.8	5.2	5.0	4.2
192	4.3	5.9	5.4	5.9
204	3.5	4.6	4.3	3.8

OD (ppm)

<b>EXPERIMENTO 4</b>				
TIEMPO Horas	CONTROL		ALTERNA	
	1a ETAPA	2a ETAPA	1a ETAPA	2a ETAPA
12	3.5	4.2	3.2	4.2
24	3.6	4.3	2.9	3.7
36	3.1	3.8	4.1	4.4
48	3.2	4.1	4.0	3.5
60	3.1	4.2	4.1	3.2
72	2.5	3.2	2.1	2.8
84	2.4	4.5	2.9	4.4
96	1.9	4.0	3.8	3.1
108	2.4	4.2	4.2	3.2
120	1.9	3.2	2.8	3.5
132	1.5	3.3	2.3	3.5
144	0.8	3.1	2.9	2.8
156	1.0	3.1	3.1	2.8
168	1.8	3.2	3.7	2.9
180	1.3	2.5	2.1	3.2
192	1.7	2.3	2.2	2.1
204	1.6	3.0	3.3	2.4
216	2.1	2.8	2.0	2.8
228	2.1	2.0	2.8	2.0
240	1.9	2.7	2.9	2.0
252	1.2	2.0	2.7	2.0
264	1.6	2.7	2.2	3.0
276	1.8	2.5	1.8	2.6
288	1.7	2.0	2.1	1.6
300	0.9	1.1	2.7	1.5
312	0.9	2.0	1.3	2.2
324	0.7	1.7	1.7	2.4

OD (ppm)

<b>EXPERIMENTO 4</b>				
(Continuación)				
TIEMPO Horas	CONTROL		ALTERNA	
	1ª ETAPA	2ª ETAPA	1ª ETAPA	2ª ETAPA
324	0.7	1.7	1.7	2.4
336	1.1	1.6	2.1	2.1
348	1.5	1.8	2.5	2.2
360	1.0	2.4	1.2	2.6
372	0.8	1.8	1.1	2.0
384	1.4	2.4	2.9	1.8
396	1.7	2.5	2.2	1.5
408	2.3	2.9	1.1	2.3
420	0.7	2.2	0.8	2.4
432	0.9	2.4	2.2	1.4
444	1.2	1.8	1.1	1.8
456	1.7	3.1	3.0	3.2
468	1.3	2.9	1.1	2.6
480	1.0	2.0	1.7	1.2
492	1.1	2.5	2.4	1.2
504	1.6	2.5	0.5	1.9
516	0.9	2.5	0.6	2.1
528	1.0	2.6	2.8	1.1
540	1.1	2.4	2.8	0.7
552	1.3	2.5	0.9	2.8
564	1.5	2.6	1.0	2.9
576	1.5	2.9	2.8	1.6
588	0.6	1.7	2.7	0.9
600	1.6	2.3	2.2	1.2
612	1.0	2.4	2.7	1.1

OD (ppm)

<b>EXPERIMENTO 5</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1a ETAPA</b>	<b>2a ETAPA</b>	<b>1a ETAPA</b>	<b>2a ETAPA</b>
12	4.6	4.7	4.3	4.3
24	3.2	3.5	3.2	3.6
36	1.9	2.9	2.9	2.2
48	2.4	3.2	3.4	3.5
60	2.9	3.2	2.8	3.1
72	3.8	4.1	3.7	3.4
84	1.9	3.5	3.3	4.3
96	0.9	3.2	4.2	3.2
108	1.7	4.3	4.1	4.3
120	2.5	3.6	3.8	3.1
132	1.6	3.3	3.4	4.2
144	2.0	3.7	3.8	3.0
156	2.1	3.9	2.9	3.4
168	1.7	3.8	3.5	2.5
180	1.9	3.9	3	4.0
192	1.6	3.4	3.1	2.8
204	2.0	3.7	2.6	2.9
216	2.1	3.5	3.3	2.8
228	2.0	3.9	2.5	2.7
240	1.9	3.0	2.7	2.4
252	1.7	3.7	2.2	3.2
264	1.6	3.1	2.8	2.6
276	1.8	3.5	2.5	2.7
288	1.6	3.1	2.3	2.0
300	1.6	3.3	2.1	2.5
312	1.9	3.7	2.2	2.0
324	1.8	3.0	1.9	2.3
336	2.0	3.5	2.4	1.8

OD (ppm)

<b>EXPERIMENTO 6</b>				
TIEMPO Horas	CONTROL		ALTERNA	
	1ª ETAPA	2ª ETAPA	1ª ETAPA	2ª ETAPA
12	5.20	5.80	5.60	5.70
24	4.60	5.30	5.20	5.40
36	4.10	4.90	4.80	4.30
48	3.20	4.10	5.10	4.90
60	3.80	4.60	5.00	4.40
72	3.30	4.00	4.50	4.10
84	2.80	3.80	4.00	4.20
96	3.50	4.50	4.20	4.50
108	3.40	4.20	3.80	3.60
120	2.90	4.60	3.90	3.20
132	2.50	4.10	3.60	3.30
144	3.00	4.30	4.00	3.90
156	2.40	3.60	3.40	3.00
168	2.50	3.50	3.10	3.00
180	2.80	3.90	3.00	2.90
192	2.30	3.30	3.30	3.00
204	2.50	3.70	3.60	3.20
216	2.10	3.10	3.10	2.80
228	1.80	3.80	2.60	2.20
240	2.30	3.40	2.80	2.60
252	1.90	3.20	2.70	2.30
264	1.60	2.90	2.40	2.70
276	1.70	3.10	2.50	2.10
288	2.20	3.30	2.70	2.40
300	1.80	2.90	2.50	2.00
312	1.60	2.70	2.00	1.70



OD (ppm)

<b>EXPERIMENTO 7</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
12	7.00	7.50	7.20	7.40
24	6.80	6.60	6.80	4.90
36	6.20	7.00	5.20	7.00
48	5.60	7.40	6.80	5.00
60	4.80	6.60	4.90	7.00
72	5.20	7.20	7.40	4.60
84	4.30	6.80	4.50	7.00
96	3.80	6.30	7.20	4.90
108	3.20	6.30	6.90	3.60
120	3.60	7.10	4.20	6.10
132	3.30	6.60	7.10	4.00
144	3.80	7.20	4.40	6.20
156	3.40	7.40	6.80	4.20
168	3.40	6.60	4.30	5.70
180	2.30	7.20	6.80	3.30
192	2.20	5.60	3.60	5.00
204	1.20	5.50	6.10	3.00
216	1.30	6.20	3.60	6.30

OD (ppm)

<b>EXPERIMENTO 8</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
12	8.3	8.5	8.1	7.8
24	7.9	8.0	7.8	7.2
36	5.5	5.5	5.5	4.8
48	3.8	5.2	5.5	4.6
60	4.0	5.4	3.8	6.1
72	3.4	5.9	6.2	3.6
84	3.7	6.4	4.8	6.5
96	3.2	7.0	7.2	4.9
108	2.9	6.4	4.4	6.7
120	2.5	6.7	6.6	3.9
132	2.5	6.6	3.9	5.7
144	2.7	6.5	6.2	4.2
156	3.0	7.1	4.6	7.0
168	2.6	7.1	6.8	3.9
180	2.5	6.8	5.0	6.8
192	2.5	6.5	6.6	3.9
204	1.9	6.1	4.3	5.5
216	1.2	1.9	5.4	3.9
228	1.1	1.8	3.8	5.4
240	1.2	1.3	5.0	3.4
252	1.4	3.7	1.4	3.7
264	1.7	1.9	4.8	3.3

OD (ppm)

<b>EXPERIMENTO 9</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
24	8.7	8.8	8.5	8.1
36	8.0	7.4	6.8	6.9
48	5.9	5.4	5.0	5.0
60	5.7	6	5	5.7
72	5.1	6.3	5.0	6.5
84	4.0	5.2	4.2	5.6
96	4.1	5.0	4.3	5.6
108	4.1	5.6	3.2	4.9
120	4.0	5.7	4.1	6.0
132	4.1	6.3	4.4	6.2
144	3.8	6.3	4.6	6.3
156	3.7	7.0	4.3	6.1
168	3.7	7.2	4.4	6.4
180	3.2	6.2	4.2	5.9
192	3.2	7.0	4.4	5.9
204	2.3	6.3	3.7	5.6
216	2.0	6.6	3.8	6.0
228	2.0	6.6	3.1	5.4
240	2.1	5.2	2.5	4.8
252	1.9	6.0	3.1	5.3
264	1.8	5.9	3.3	5.1

# TEMPERATURAS (°C)

<b>EXPERIMEN TO1</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIEN TE</b>
24	23.2	22.0
72	21.0	20.0
120	21.6	20.0
168	21.9	20.5
216	22.2	21.0
264	23.2	23.0

# TEMPERATURAS (°C)

<b>EXPERIMEN T02</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIEN TE</b>
24	24.0	22.5
36	24.0	22.5
48	23.5	22.5
60	24.1	23.2
72	24.6	24.0
84	23.7	23.3
96	22.9	22.6
108	22.5	22.0
120	22.5	22.0
132	22.5	22.0
144	22.4	22.0
156	24.5	23.0
168	23.0	22.0
180	24.2	22.0
192	23.0	22.0
204	22.7	23.0
216	22.4	22.0
228	24.8	23.0
240	23.7	22.5

# TEMPERATURAS (°C)

<b>EXPERIMEN T03</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIEN TE</b>
24	23.6	23.0
36	24.2	23.0
48	24.8	23.0
60	23.5	23.0
72	24.1	23.0
84	22.4	21.5
96	23.0	22.0
108	21.9	21.0
120	23.0	21.0
132	20.7	21.0
144	24.1	22.5
156	23.4	22.5
168	23.4	22.0
180	23.5	22.0
192	23.5	23.0
204	23.1	22.0

# TEMPERATURAS (°C)

<b>EXPERIMEN T04</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIEN TE</b>
12	24.2	22.0
24	25.0	23.0
36	23.5	22.0
48	23.1	22.5
60	22.1	21.5
72	25.5	23.0
84	23.2	22.0
96	24.6	23.5
108	23.1	22.0
120	24.8	22.2
132	22.9	22.5
144	24.5	22.0
156	22.0	21.5
168	25.0	22.0
180	23.0	22.0
192	24.1	22.0
204	23.1	22.0
216	24.2	22.0
228	22.9	22.0
240	24.0	23.0
252	22.8	22.0
264	24.6	21.0
276	23.3	22.0
288	24.1	22.6
300	22.9	23.2
312	24.9	24.0
324	24.6	22.5

# TEMPERATURAS (°C)

<b>EXPERIMEN TO 4</b> (Continuación)		
<b>TIEMPO</b> Horas	<b>AGUA</b> RESD.	<b>AMBIEN</b> TE
336	23.1	23.0
348	22.3	23.5
360	25.4	22.7
372	23.0	22.0
384	25.1	23.0
396	23.7	22.0
408	24.7	22.3
420	23.2	22.6
432	24.1	23.0
444	24.2	22.0
456	23.1	21.0
468	20.6	21.0
480	21.4	21.0
492	20.7	19.0
504	22.4	18.0
516	20.8	20.0
528	18.8	18.5
540	19.0	18.5
552	19.4	19.0
564	19.8	19.5
576	20.0	18.6
588	19.5	18.0
600	19.8	19.5
612	19.8	18.0



# TEMPERATURAS (°C)

<b>EXPERIMEN TO5</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIEN TE</b>
12	20.8	19.0
24	20.9	19.0
36	21.0	19.0
48	18.8	17.0
60	20.6	19.0
72	18.9	18.0
84	18.7	18.0
96	18.8	18.5
108	20.0	18.2
120	18.9	18.0
132	18.3	18.0
144	17.7	17.0
156	18.9	17.5
168	19.0	17.5
180	18.7	17.5
192	17.8	17.0
204	19.6	18.0
216	18.3	17.0
228	18.6	17.0
240	18.1	16.5
252	18.8	18.0
264	19.2	17.0
276	19.6	17.5
288	18.8	17.2
300	18.1	17.0
312	18.0	16.0
324	18.0	17.0
336	18.0	16.0
348	18.0	16.0

# TEMPERATURAS (°C)

<b>EXPERIMEN T06</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIEN TE</b>
12	18.0	16.0
24	17.9	16.0
36	17.6	15.0
48	18.0	16.0
60	18.2	16.0
72	17.6	15.5
84	17.5	15.5
96	17.4	15.5
108	17.2	15.0
120	18.0	16.0
132	17.8	15.0
144	17.5	15.5
156	17.2	15.0
168	17.3	15.0
180	17.0	15.0
192	17.2	15.5
204	17.3	15.5
216	17.0	15.5
228	17.5	16.0
240	17.4	15.5
252	17.9	16.0
264	17.4	15.0
276	17.6	16.5
288	17.7	16.2
300	17.9	16.0
312	18.0	16.0

# TEMPERATURAS (°C)

<b>EXPERIMEN T07</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIEN TE</b>
12	18.3	16.5
24	19.0	18.0
36	18.8	16.5
48	18.2	16.2
60	18.3	16.0
72	17.8	15.0
84	18.2	13.5
96	18.0	17.0
108	17.8	16.5
120	18.1	17.0
132	17.9	16.5
144	17.9	16.0
156	17.6	16.5
168	18.1	17.0
180	17.6	16.0
192	18.4	17.0
204	17.7	16.5
216	16.9	15.5

# TEMPERATURAS (°C)

<b>EXPERIMENTOS</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIENTE</b>
12	17.0	16.0
24	16.4	16.0
36	17.7	16.0
48	17.3	15.5
60	18.1	17.0
72	18.1	16.5
84	17.4	16.0
96	16.3	15.5
108	16.4	16.5
120	16.6	14.5
132	17.7	15.5
144	17.3	15.2
156	16.9	15.0
168	16.7	14.5
180	17.8	15.5
192	16.9	15.0
204	16.9	15.0
216	15.9	14.0
228	16.6	14.5
240	16.4	14.5
252	16.8	14.2
264	15.8	14.0

# TEMPERATURAS (°C)

<b>EXPERIMEN T09</b>		
<b>TIEMPO Horas</b>	<b>AGUA RESD.</b>	<b>AMBIEN TE</b>
24	16.3	14.0
36	16.8	14.5
48	17.2	16.0
60	16.1	13.0
72	15.0	12.0
84	16.3	13.5
96	16.9	15.0
108	17.6	15.5
120	17.0	15.0
132	17.5	15.0
144	17.2	15.0
156	18.6	16.5
168	17.6	16.0
180	18.7	16.5
192	18.3	16.0
204	19.3	16.0
216	19.3	16.0
228	19.4	16.0
240	19.5	16.0
252	19.0	16.0
264	18.0	16.0

# ESPESORES (mm)

<b>EXPERIMENTO 1</b>				
<b>TIEMPO</b> Horas	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª</b> <b>ETAPA</b>	<b>2ª</b> <b>ETAPA</b>	<b>1ª</b> <b>ETAPA</b>	<b>2ª</b> <b>ETAPA</b>
24	0.5120	0.1200	0.4660	0.3100
72	1.5250	0.1450	0.9550	1.0050
120	1.7550	0.1550	1.2500	1.1185
168	2.0350	0.1600	1.5160	1.3300
216	1.9250	0.1425	1.4500	1.2500
264	2.0100	0.1430	1.4700	1.3650

## ESPESORES (mm)

<b>EXPERIMENTO 2</b>				
<b>TIEMPO</b> Horas	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª</b> <b>ETAPA</b>	<b>2ª</b> <b>ETAPA</b>	<b>1ª</b> <b>ETAPA</b>	<b>2ª</b> <b>ETAPA</b>
48	1.8950	0.1300	1.3850	1.3550
96	1.7250	0.1300	1.2700	1.1570
144	1.9050	0.1600	1.4700	1.3600
192	2.1050	0.1600	1.5000	1.4600
240	1.9500	0.1550	1.3700	1.3500

## ESPESORES (mm)

<b>EXPERIMENTO 3</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
36	1.8250	0.1500	1.3500	1.2800
84	1.8000	0.1550	1.4000	1.3000
132	1.9900	0.1600	1.4800	1.4500
180	1.9500	0.1550	1.4200	1.4300



# ESPESORES (mm)

<b>EXPERIMENTO 4</b>				
TIEMPO Horas	CONTROL		ALTERNA	
	1ª ETAPA	2ª ETAPA	1ª ETAPA	2ª ETAPA
24	1.7200	0.2870	1.1640	0.7570
72	2.5550	0.2187	1.3180	1.4125
120	2.7560	0.4000	1.6680	1.3190
168	3.0250	0.4680	1.5530	1.6680
216	3.6500	0.3810	1.6750	1.2375
264	3.3000	0.3810	1.6000	1.7000
312	3.5570	0.5250	1.2430	1.7310
360	3.3750	0.4250	1.1870	1.2787
408	3.8500	0.5500	1.6060	1.4125
456	3.8650	0.4370	1.2810	1.9120
504	3.5250	0.5560	2.1500	1.7810
552	3.8620	0.5620	1.6750	1.8370
600	3.7650	0.5250	2.0410	2.0870

## ESPESORES (mm)

<b>EXPERIMENTO 5</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
48	1.3570	0.2350	0.7930	0.6060
96	2.1750	0.3500	1.1250	1.0370
144	2.7820	0.3550	1.3500	1.4310
192	2.8310	0.4250	1.7350	1.4000
240	3.6870	0.3750	1.7300	1.8750
288	3.5750	0.4540	1.7550	1.8500
336	3.6580	0.4500	1.7350	1.7850

## ESPESORES (mm)

<b>EXPERIMENTO 6</b>				
TIEMPO Horas	CONTROL		ALTERNA	
	1ª ETAPA	2ª ETAPA	1ª ETAPA	2ª ETAPA
36	1.2000	0.0800	0.7000	0.6000
84	1.7250	0.2750	1.1250	0.8750
132	2.5125	0.3125	1.4187	1.3750
180	2.8750	0.4750	1.8000	1.7550
216	3.6400	0.6250	2.1250	1.9750
264	3.8250	0.4250	2.0750	2.1000
312	3.7550	0.5125	1.9875	2.0750

## ESPESORES (mm)

<b>EXPERIMENTO 7</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
24	0.3500	0.0300	0.1500	0.1200
72	1.7070	0.4200	1.0750	0.9850
120	3.6750	0.6250	2.2200	2.1550
168	4.9500	0.6640	3.4750	3.3500
216	6.0000	0.7930	3.7100	3.6250

## ESPESORES (mm)

<b>EXPERIMENTO 8</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
24	0.3725	0.0250	0.1300	0.1420
72	1.8420	0.4120	0.9430	1.0560
120	3.4250	0.6870	1.9560	1.9870
168	4.7630	0.5310	3.1960	3.2500
216	5.4250	0.7680	3.6370	3.4680
264	6.0000	0.7720	3.7500	3.6850

## ESPESORES (mm)

<b>EXPERIMENTO 9</b>				
<b>TIEMPO Horas</b>	<b>CONTROL</b>		<b>ALTERNA</b>	
	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>	<b>1ª ETAPA</b>	<b>2ª ETAPA</b>
24	0.3750	0.0550	0.1450	0.1400
72	1.8750	0.2430	1.0050	0.9895
120	3.7250	0.7310	2.2250	2.3000
168	4.8750	0.7300	3.4000	3.4500
216	5.6250	0.7700	3.6500	3.6000
264	6.0000	0.7600	3.7000	3.7500

## SOLIDOS TOTALES (ppm)

<b>EXPERIMENTO 1</b>		
<b>TIEMPO</b> Horas	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
48	3	2
96	26	15
144	38	29
192	22	43
240	15	12

## SOLIDOS TOTALES (ppm)

<b>EXPERIMENTO 2</b>		
<b>TIEMPO Horas</b>	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
48	5	5
96	47	42
144	28	43
192	5	44
240	26	13



## SOLIDOS TOTALES (ppm)

<b>EXPERIMENTO 3</b>		
<b>TIEMPO Horas</b>	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
48	5	15
108	10	15
156	12	12
204	3	5

## SOLIDOS TOTALES (ppm)

<b>EXPERIMENTO 4</b>		
<b>TIEMPO Horas</b>	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
48	5	5
96	15	15
144	4	3
192	10	49
240	5	4
288	50	10
336	4	42
384	30	40
432	20	20
480	31	18
528	20	20
576	40	20

## SOLIDOS TOTALES (ppm)

<b>EXPERIMENTO 5</b>		
<b>TIEMPO Horas</b>	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
72	5	5
120	50	7
168	20	5
216	45	10
264	50	20

## SOLIDOS TOTALES (ppm)

<b>EXPERIMENTO 6</b>		
<b>TIEMPO</b> Horas	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
48	8	12
96	10	5
144	15	5
192	5	16
240	25	0
288	30	15

## SOLIDOS TOTALES (ppm)

<b>EXPERIMENTO 7</b>		
<b>TIEMPO Horas</b>	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
48	12	22
96	10	35
144	15	30
192	37	15

## SOLIDOS TOTALES (ppm)

<b>EXPERIMENTO 8</b>		
<b>TIEMPO Horas</b>	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
48	20	20
96	45	40
144	48	45
192	15	30
240	12	8

## SOLIDOS TOTALES (ppm)

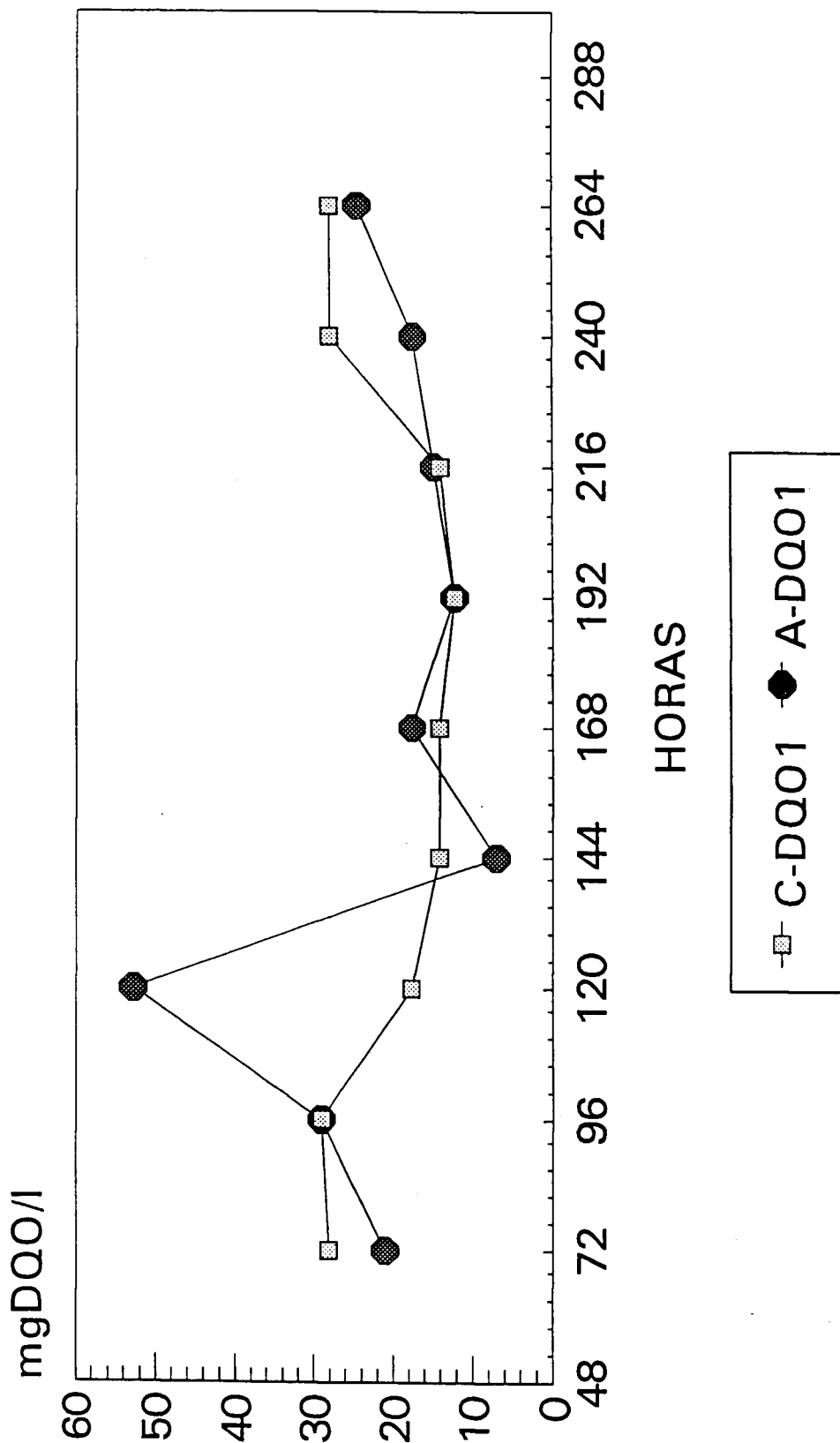
<b>EXPERIMENTO 9</b>		
<b>TIEMPO Horas</b>	<b>CONTROL</b>	<b>ALTERNA</b>
	<b>EFLUENTE</b>	<b>EFLUENTE</b>
48	15	12
96	55	10
144	45	50
192	38	44
240	11	28

## **APENDICE 2**



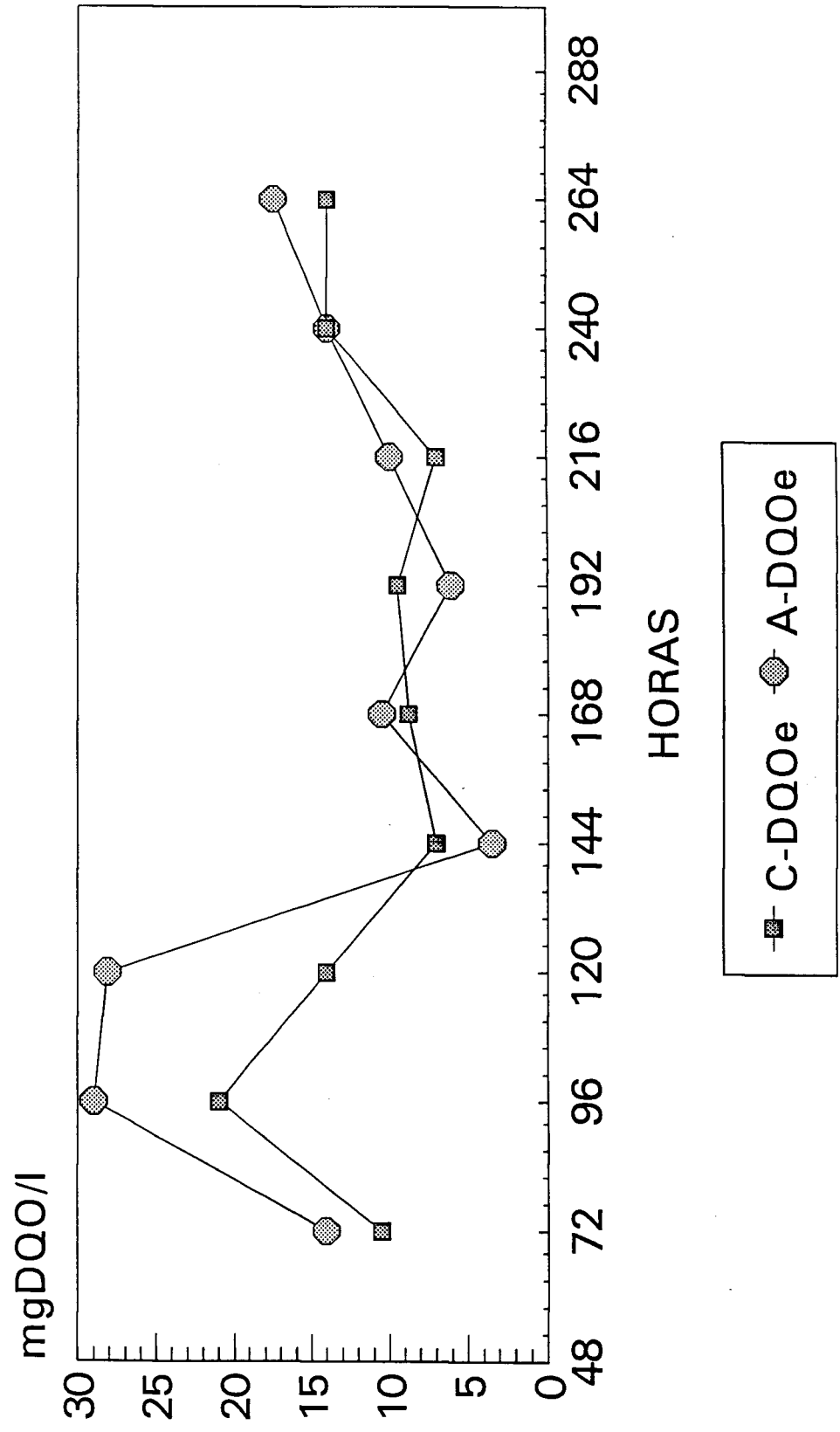
# DESARROLLO BIOPELICULA

## Experimento 1



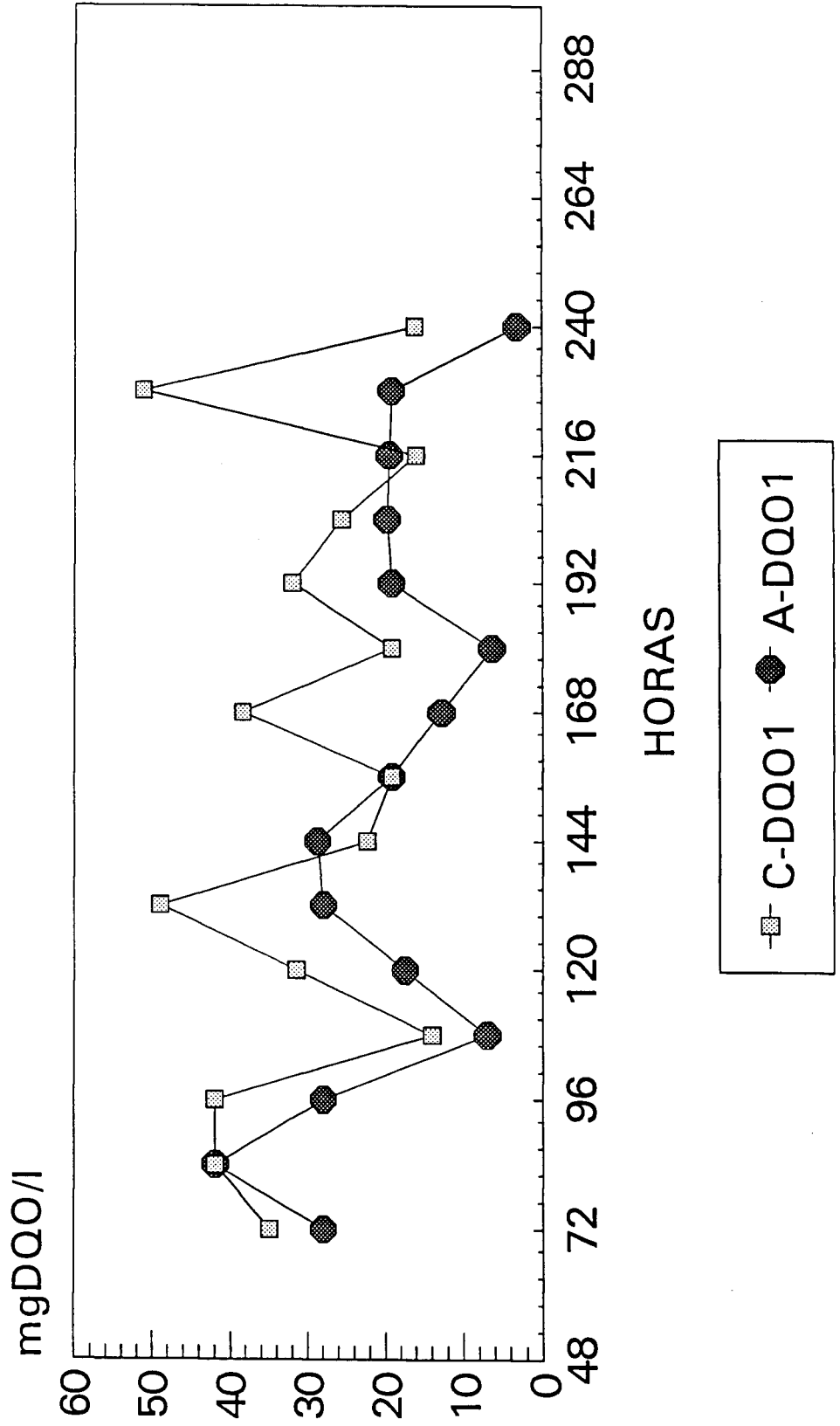
# DESARROLLO BIOPELICULA

## Experimento 1



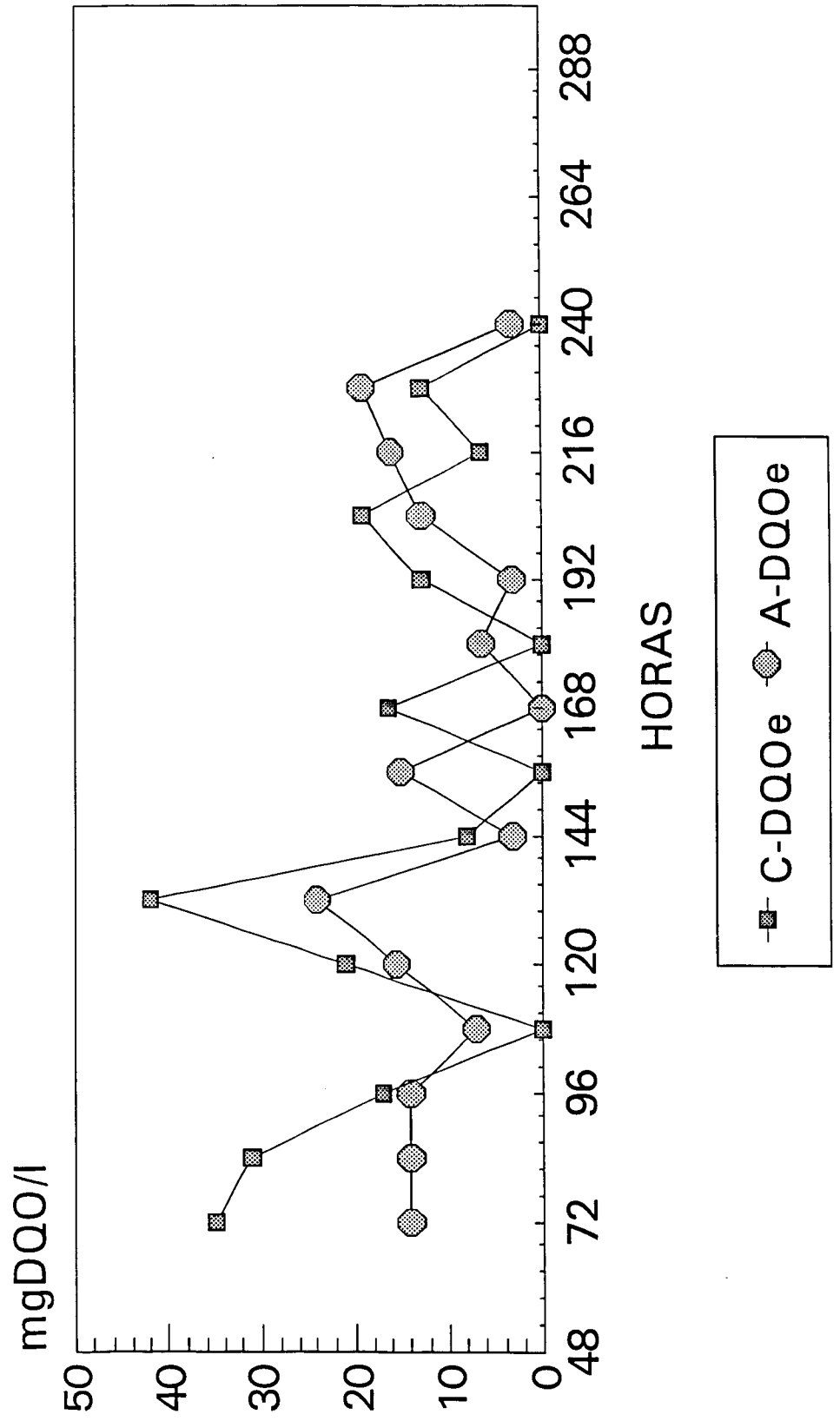
# DESARROLLO BIOPELICULA

## Experimento 2



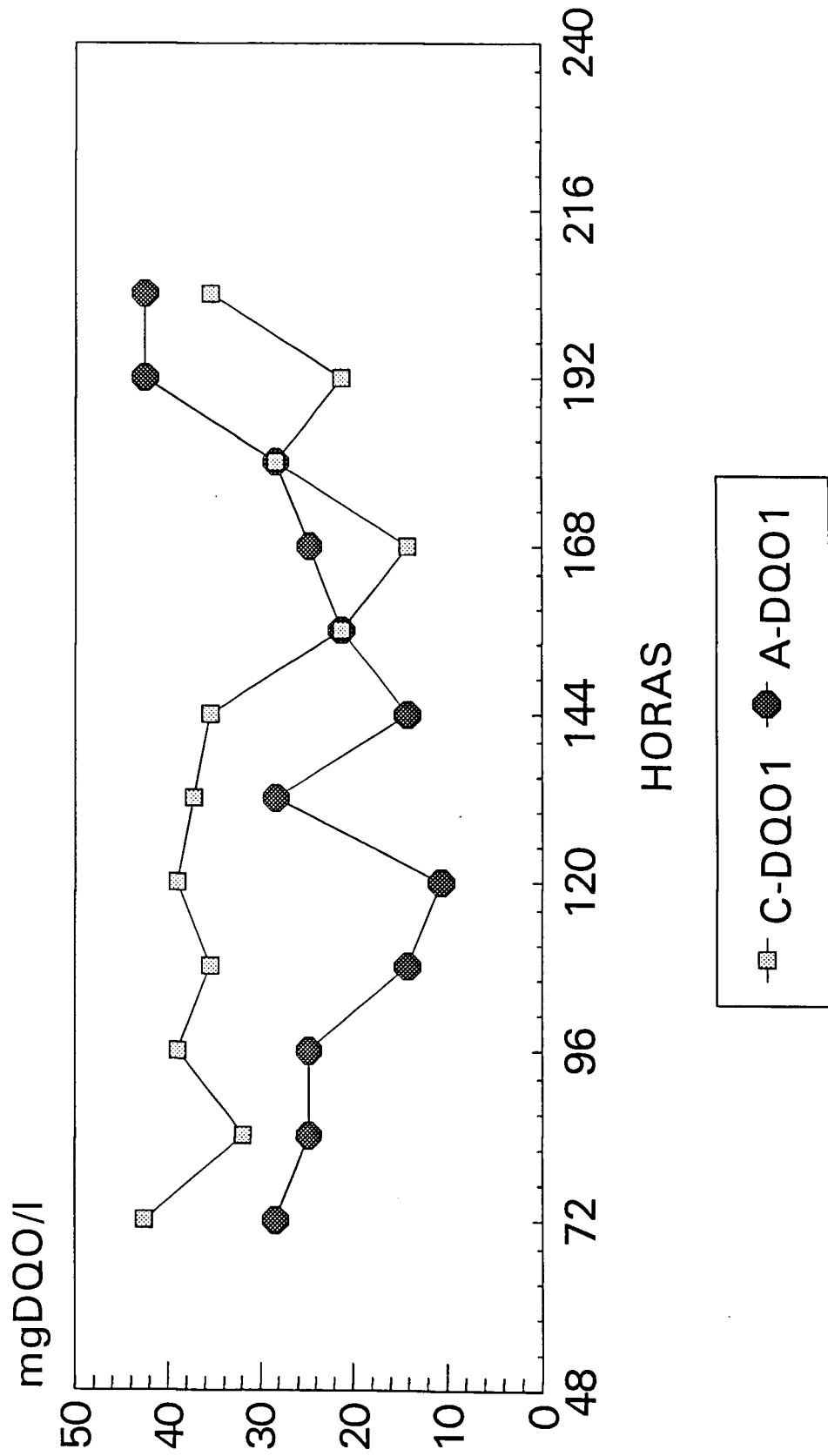
# DESARROLLO BIOPELICULA

## Experimento 2



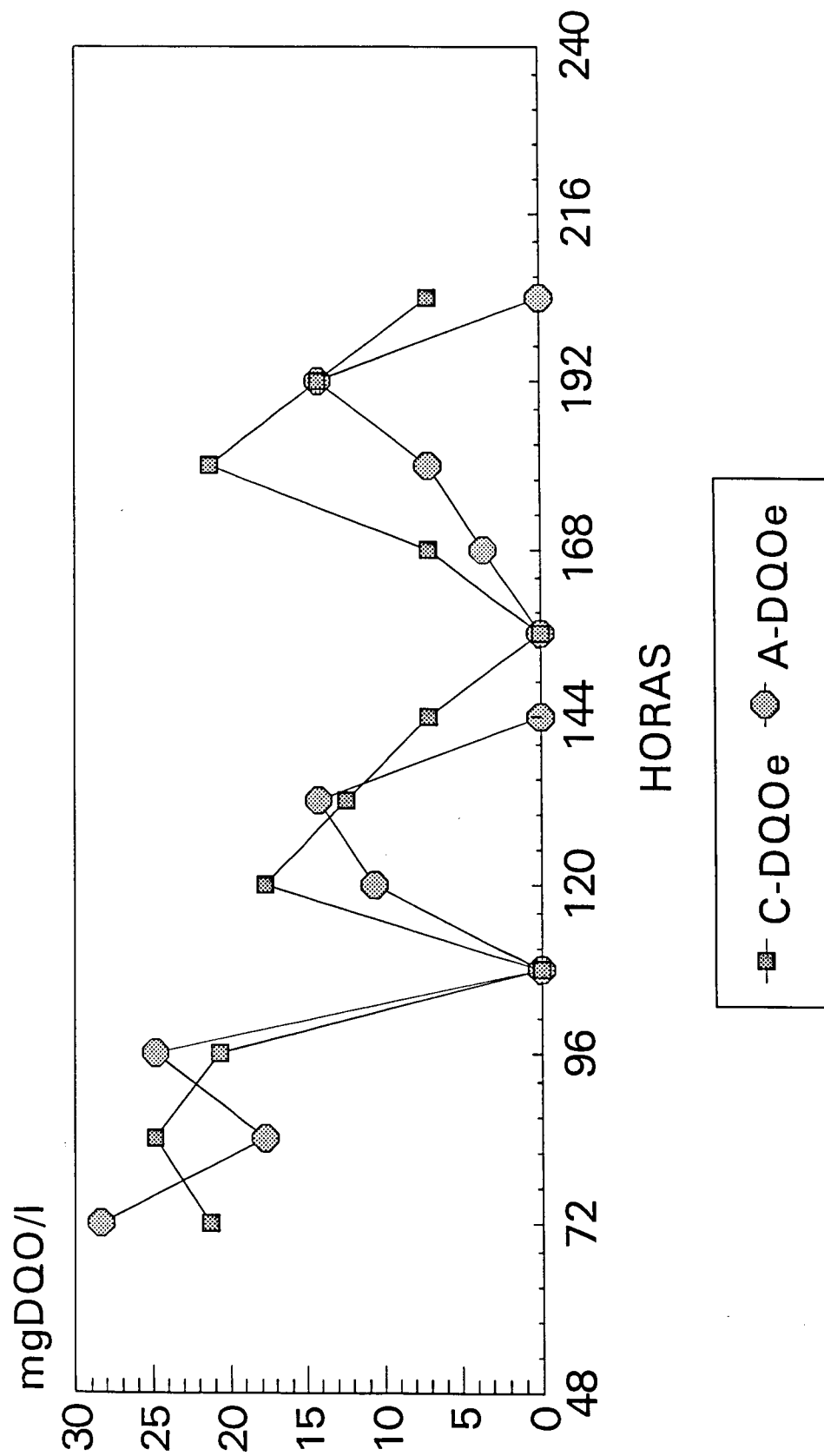
# DESARROLLO BIOPELICULA

## Experimento 3



# DESARROLLO BIOPELICULA

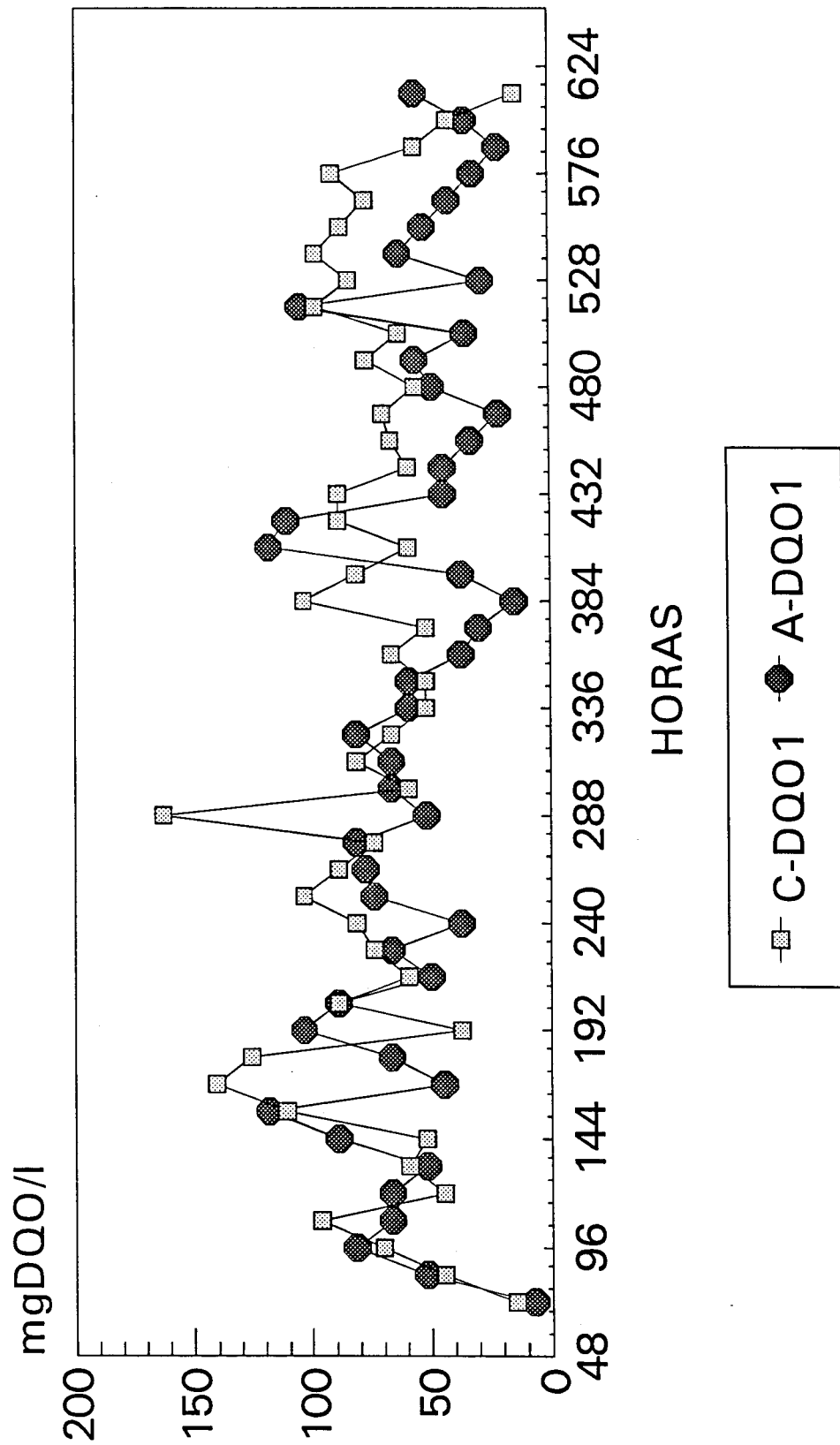
## Experimento 3



Efluente

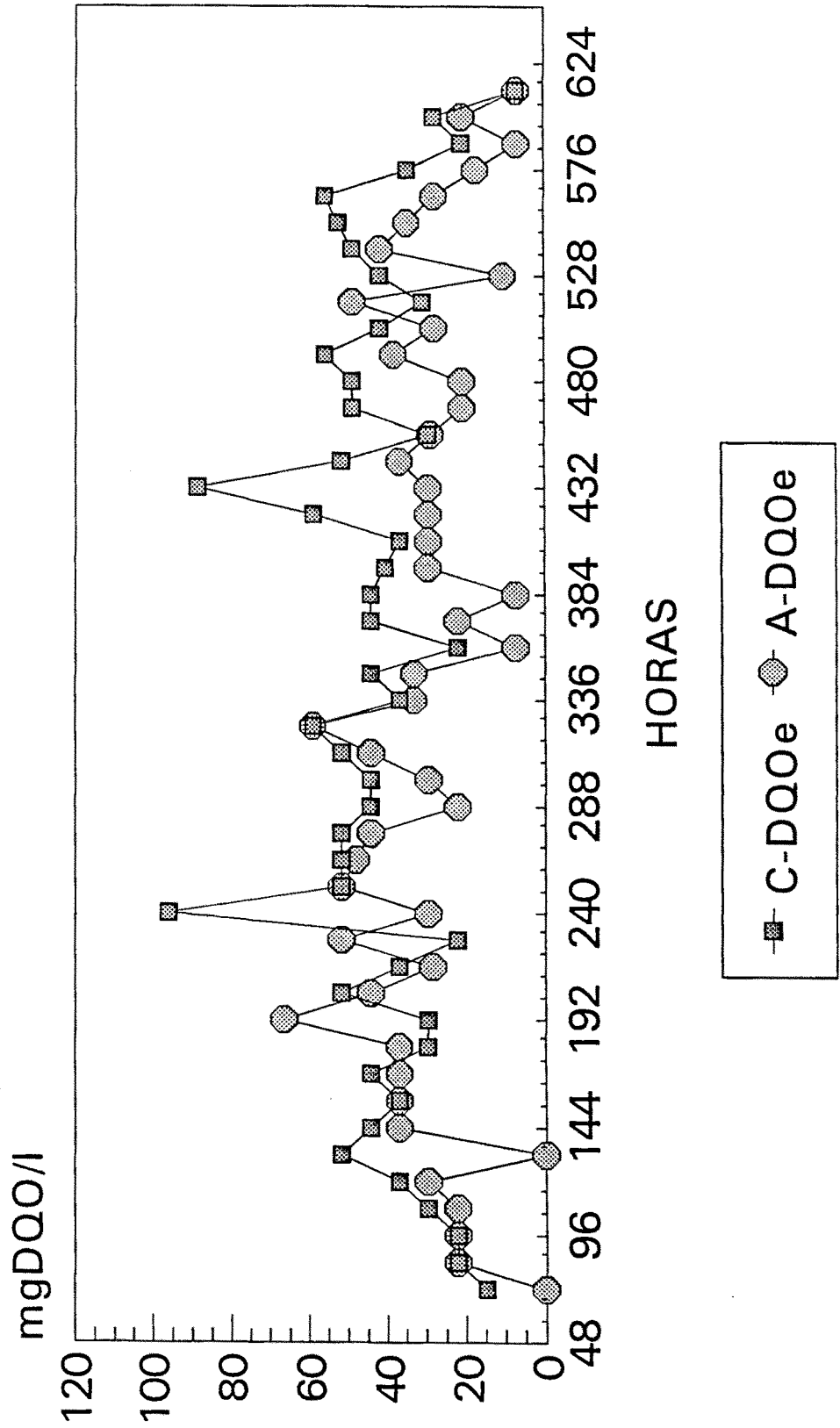
# DESARROLLO BIOPELICULA

## Experimento 4



# DESARROLLO BIOPELICULA

## Experimento 4

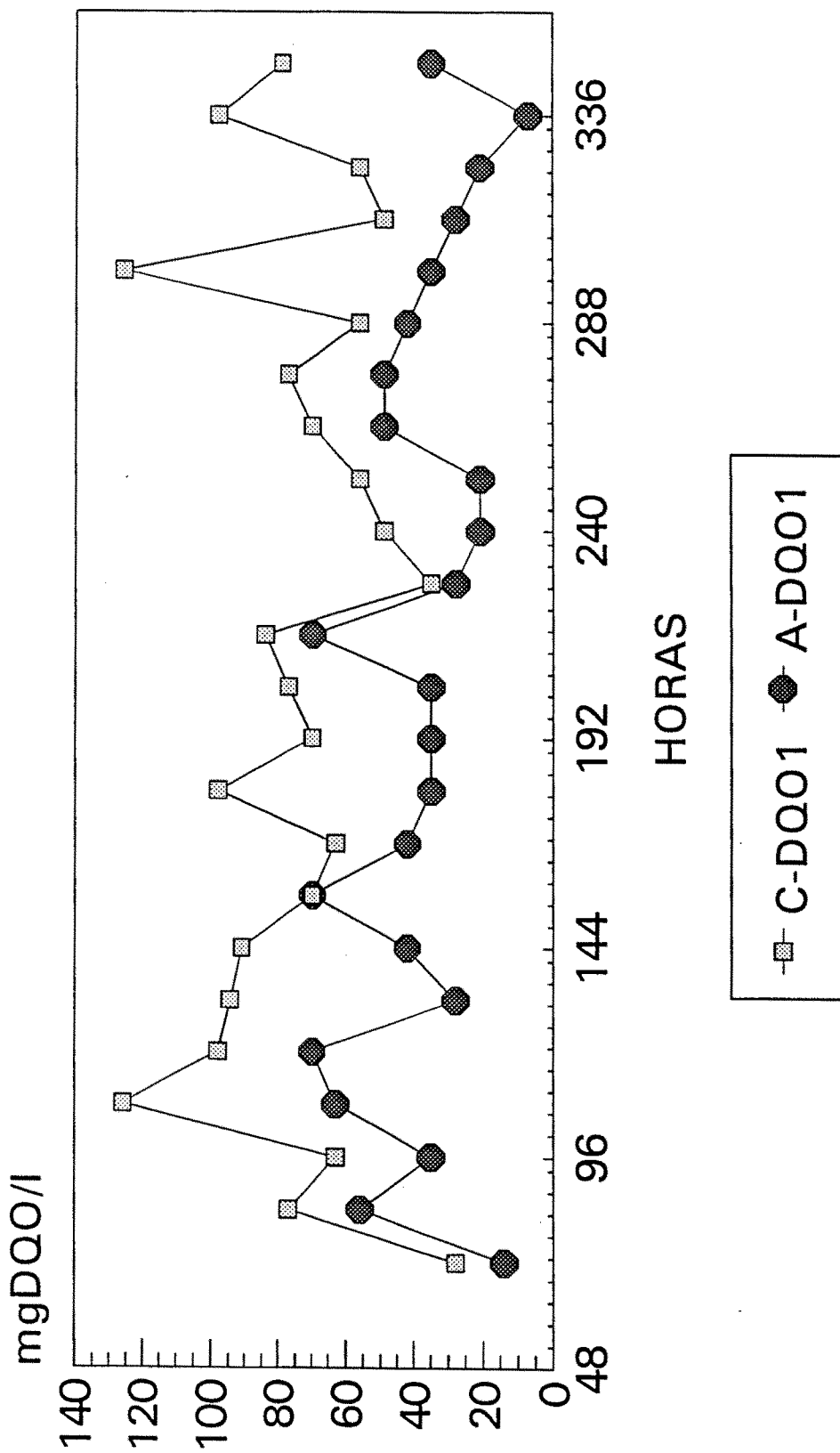


Efluente



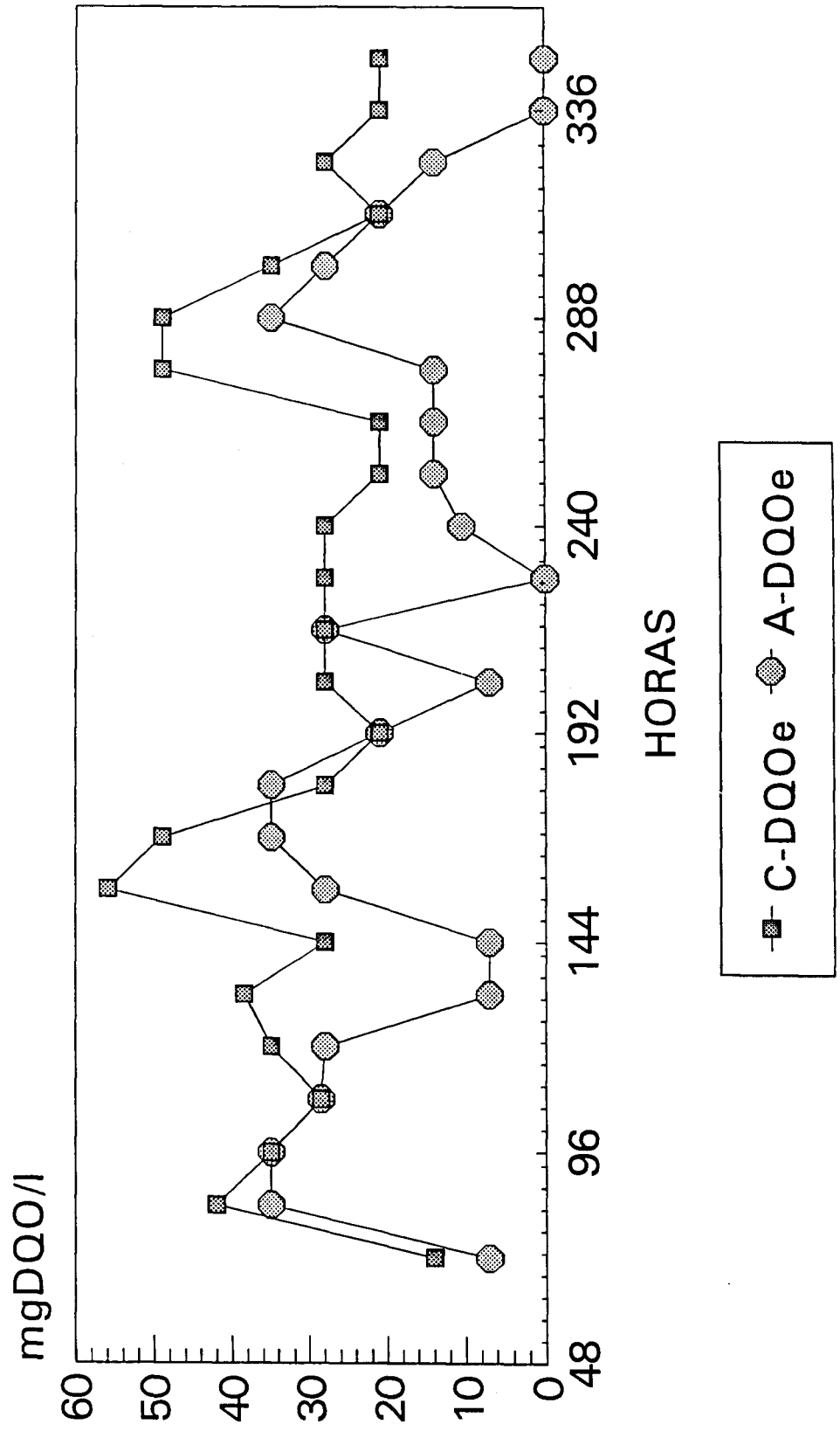
# DESARROLLO BIOPELICULA

## Experimento 5



# DESARROLLO BIOPELICULA

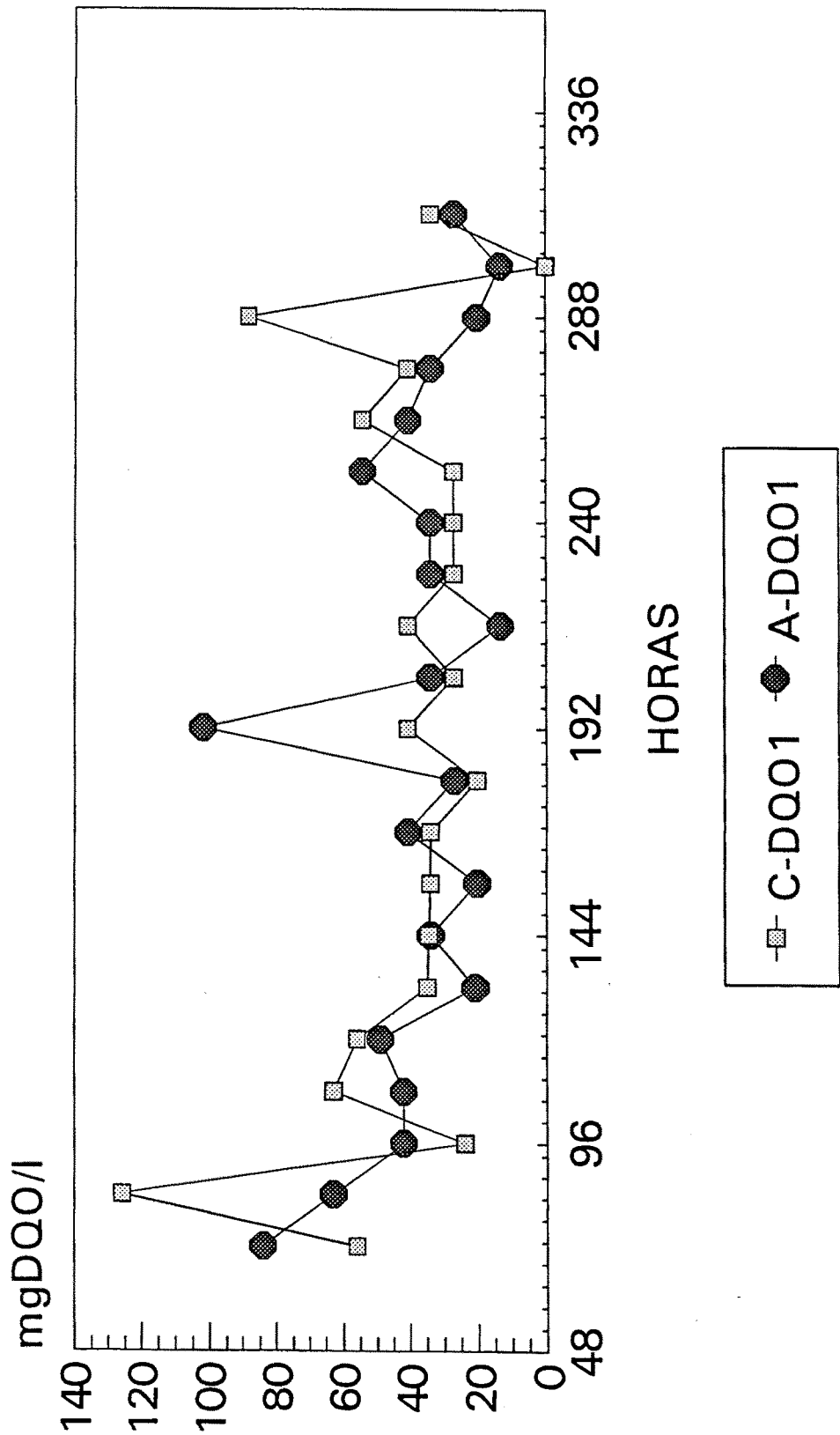
## Experimento 5



Efluente

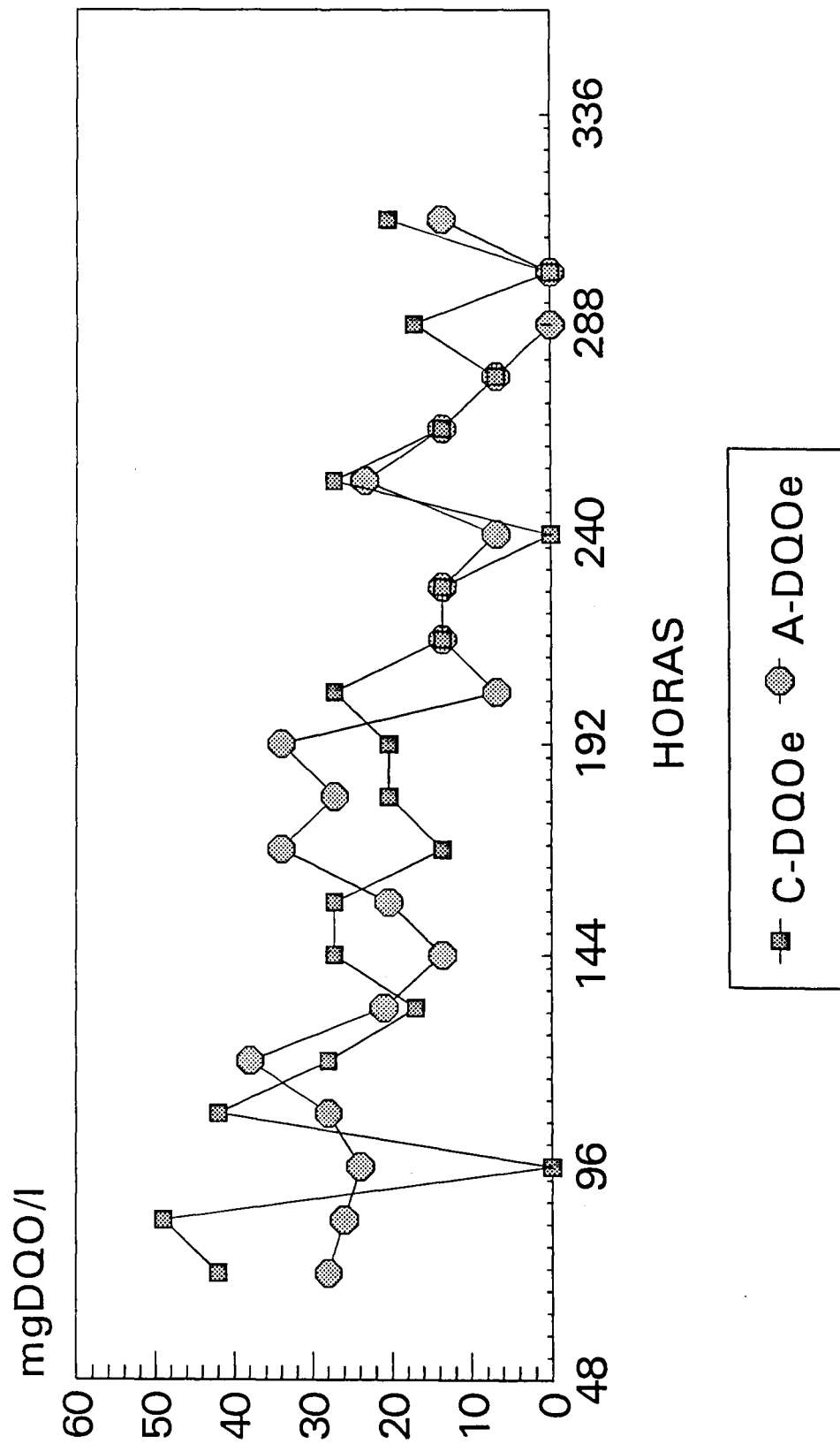
# DESARROLLO BIOPELICULA

## Experimento 6



# DESARROLLO BIOPELICULA

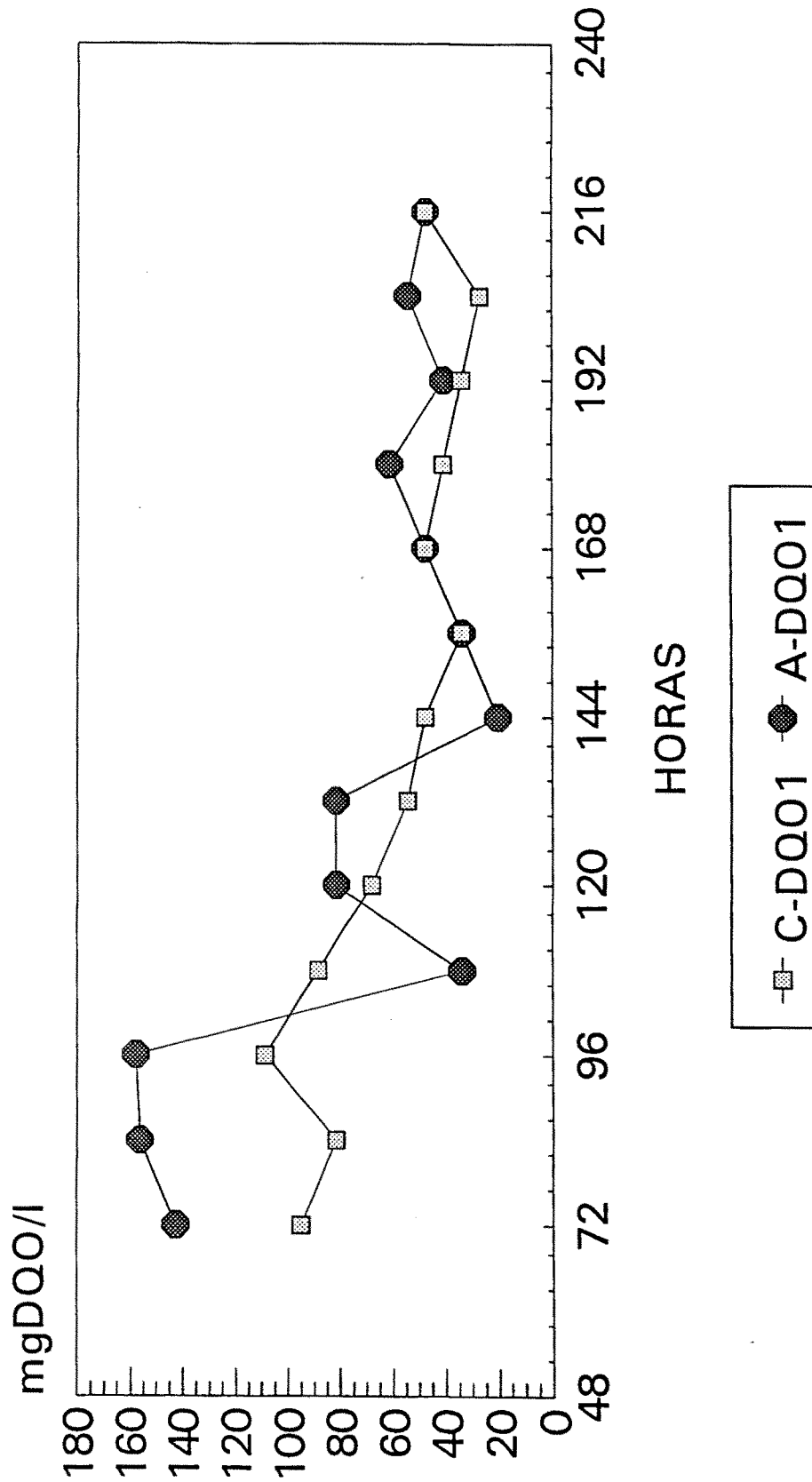
## Experimento 6



Efluente

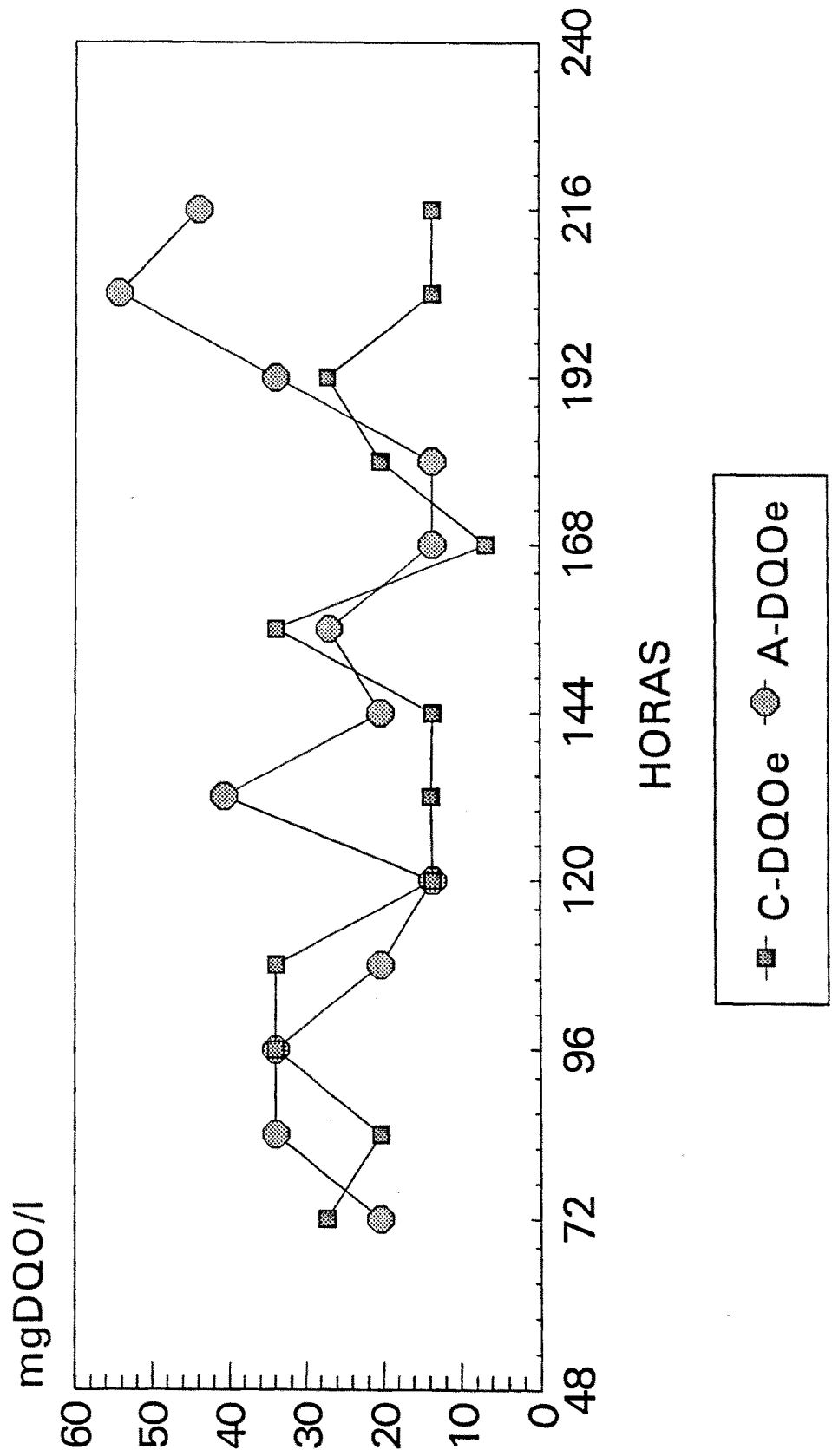
# DESARROLLO BIOPELICULA

## Experimento 7



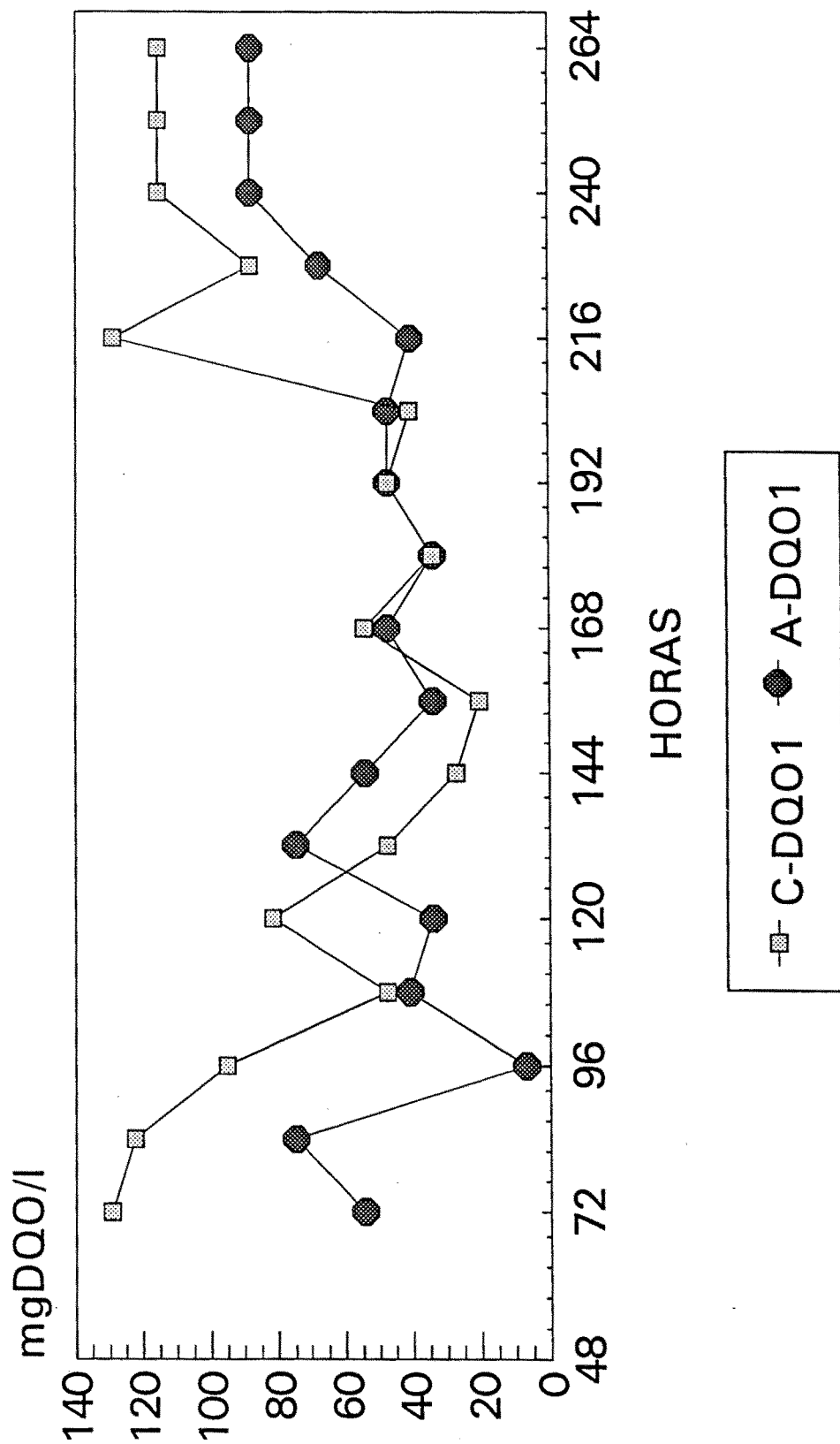
# DESARROLLO BIOPELICULA

## Experimento 7



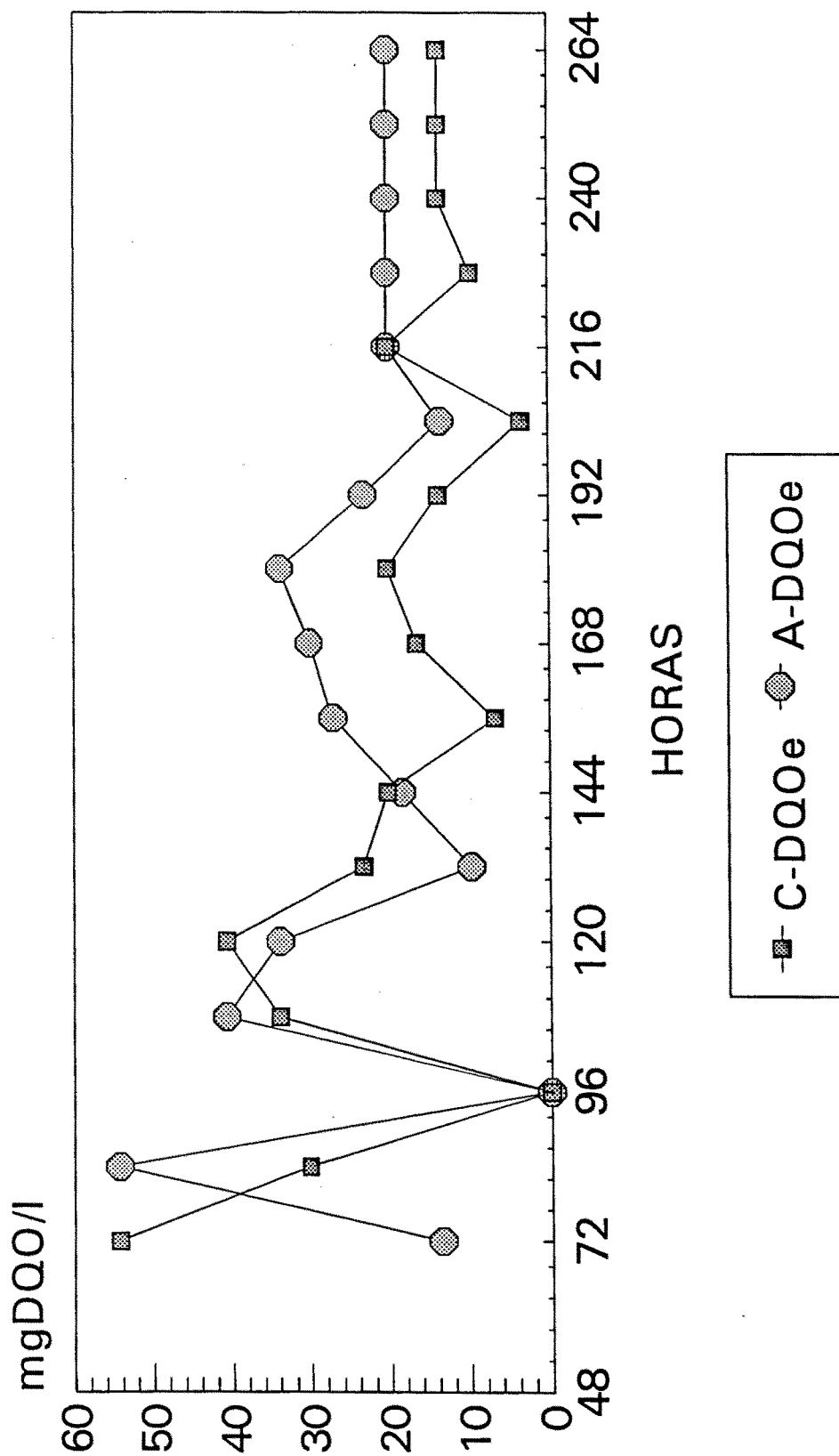
# DESARROLLO BIOPELICULA

## Experimento 8



# DESARROLLO BIOPELICULA

## Experimento 8

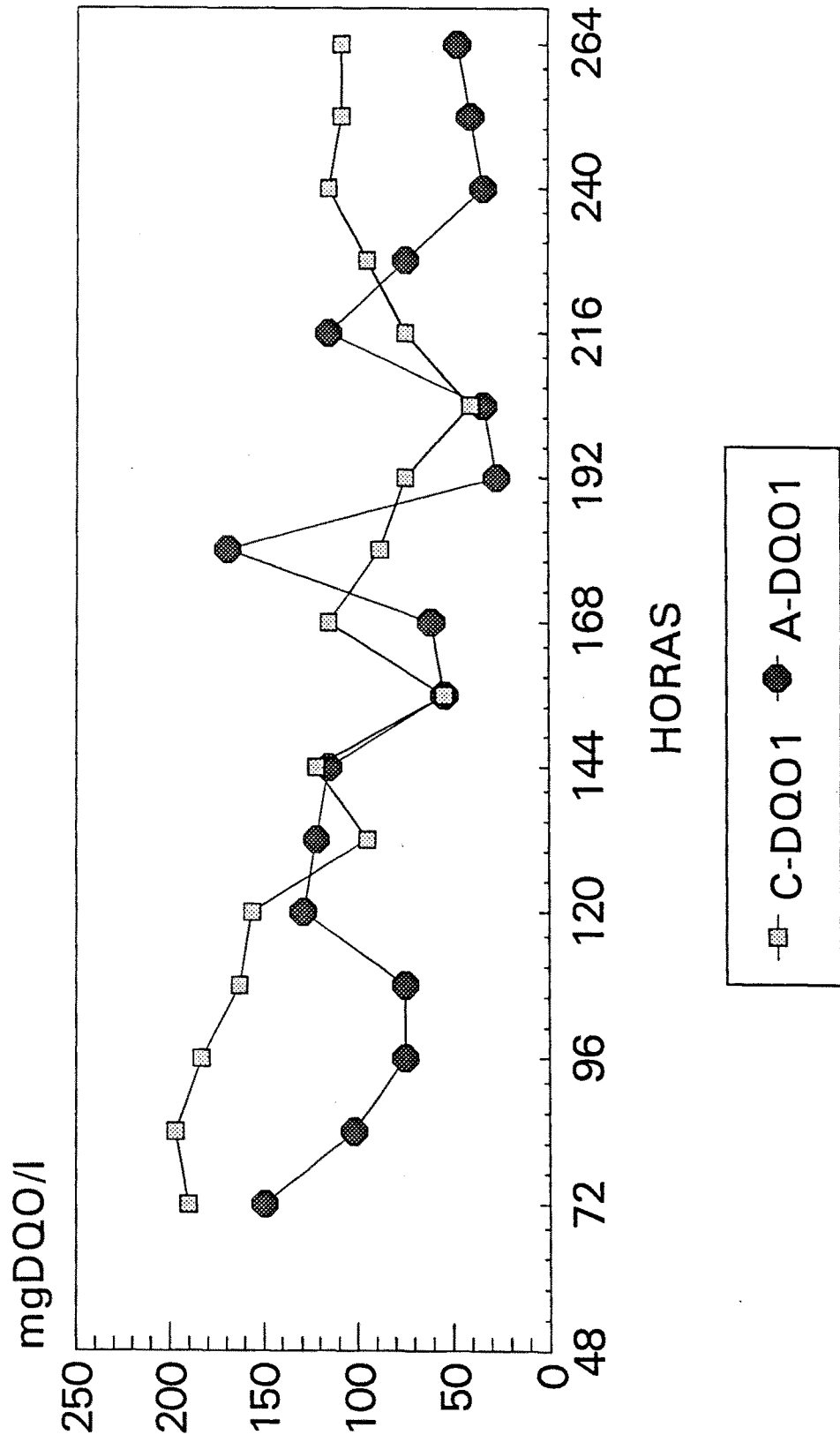


Efluente



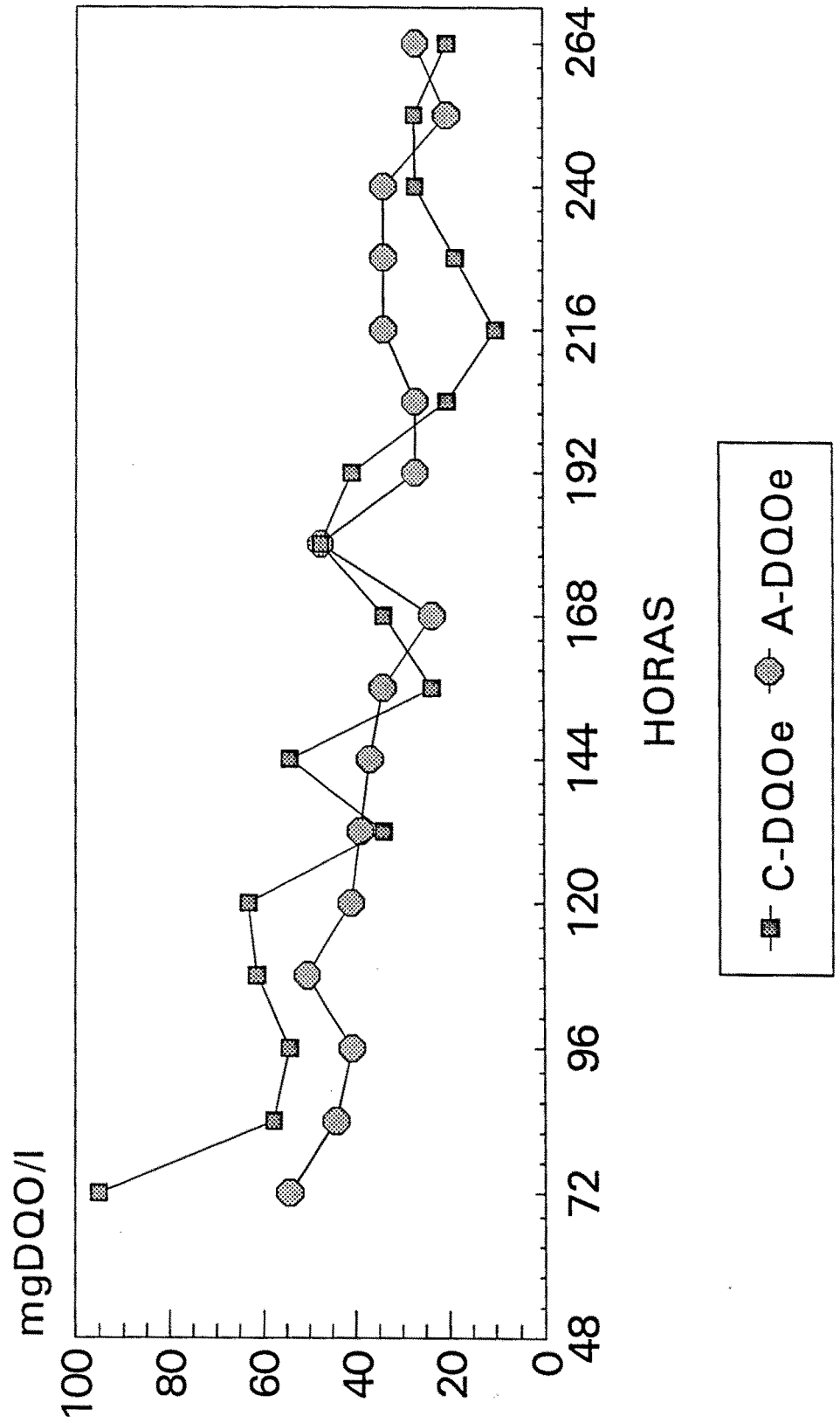
# DESARROLLO BIOPELICULA

## Experimento 9



# DESARROLLO BIOPELICULA

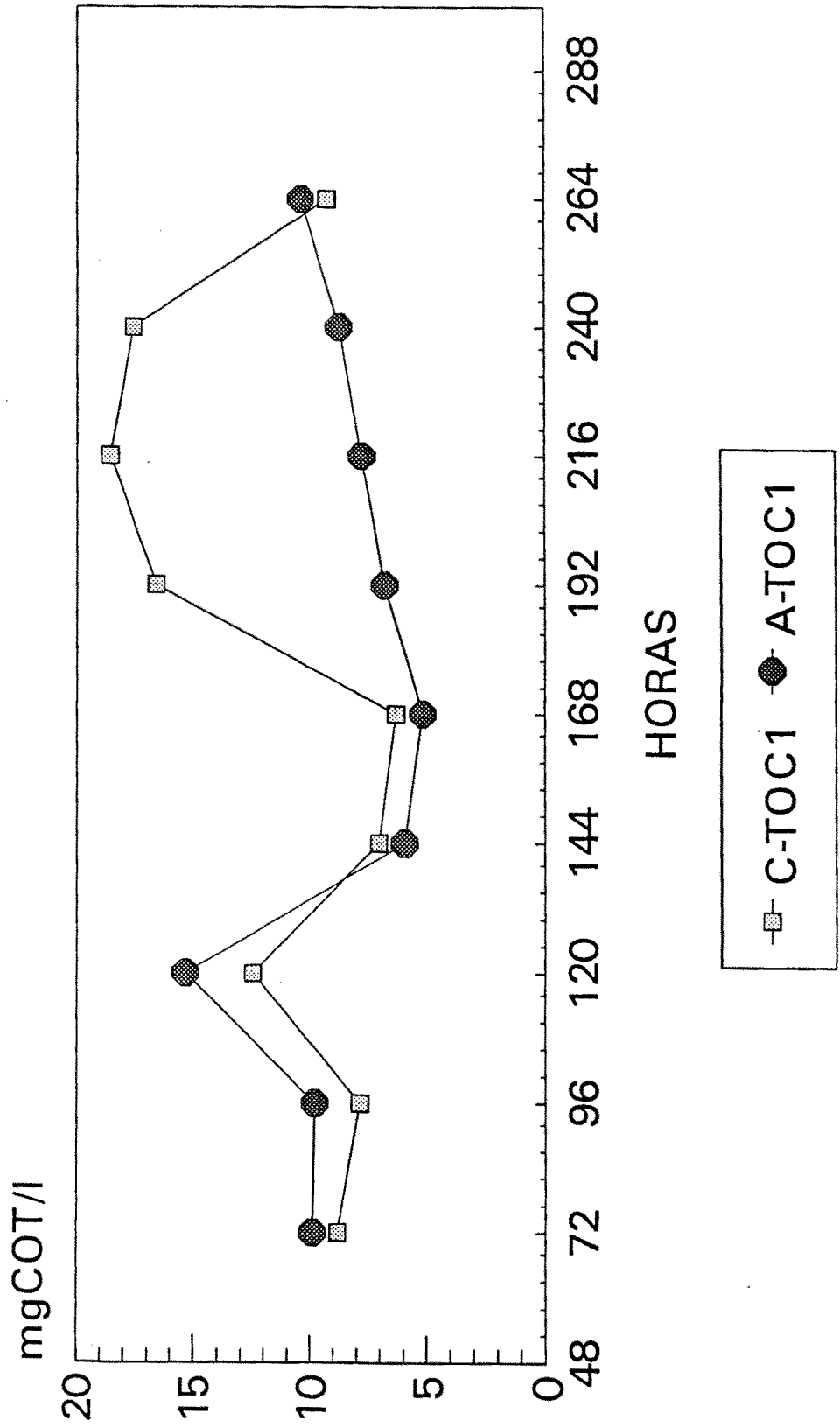
## Experimento 9



Efluente

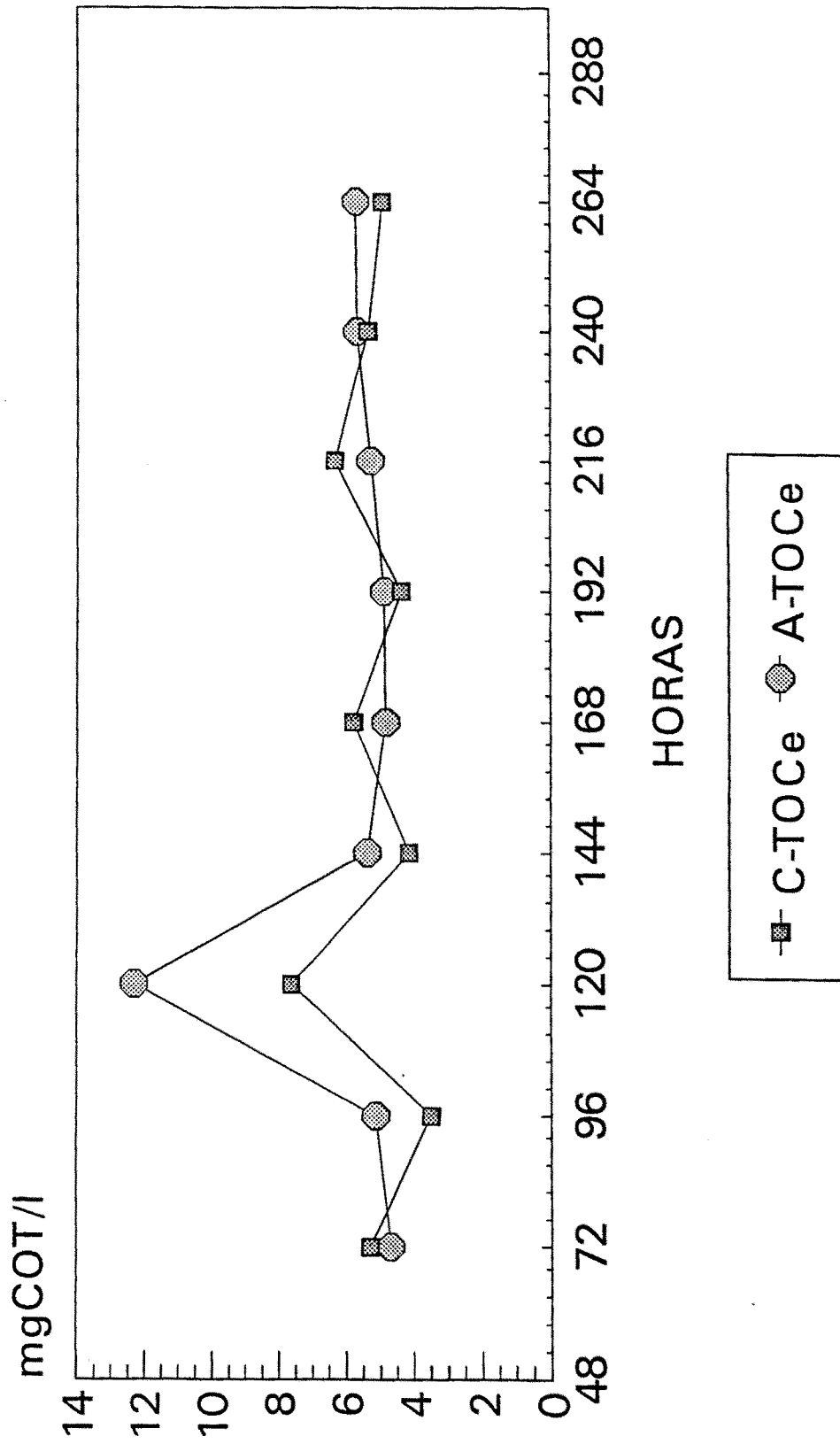
# DESARROLLO BIOPELICULA

## Experimento 1



# DESARROLLO BIOPELICULA

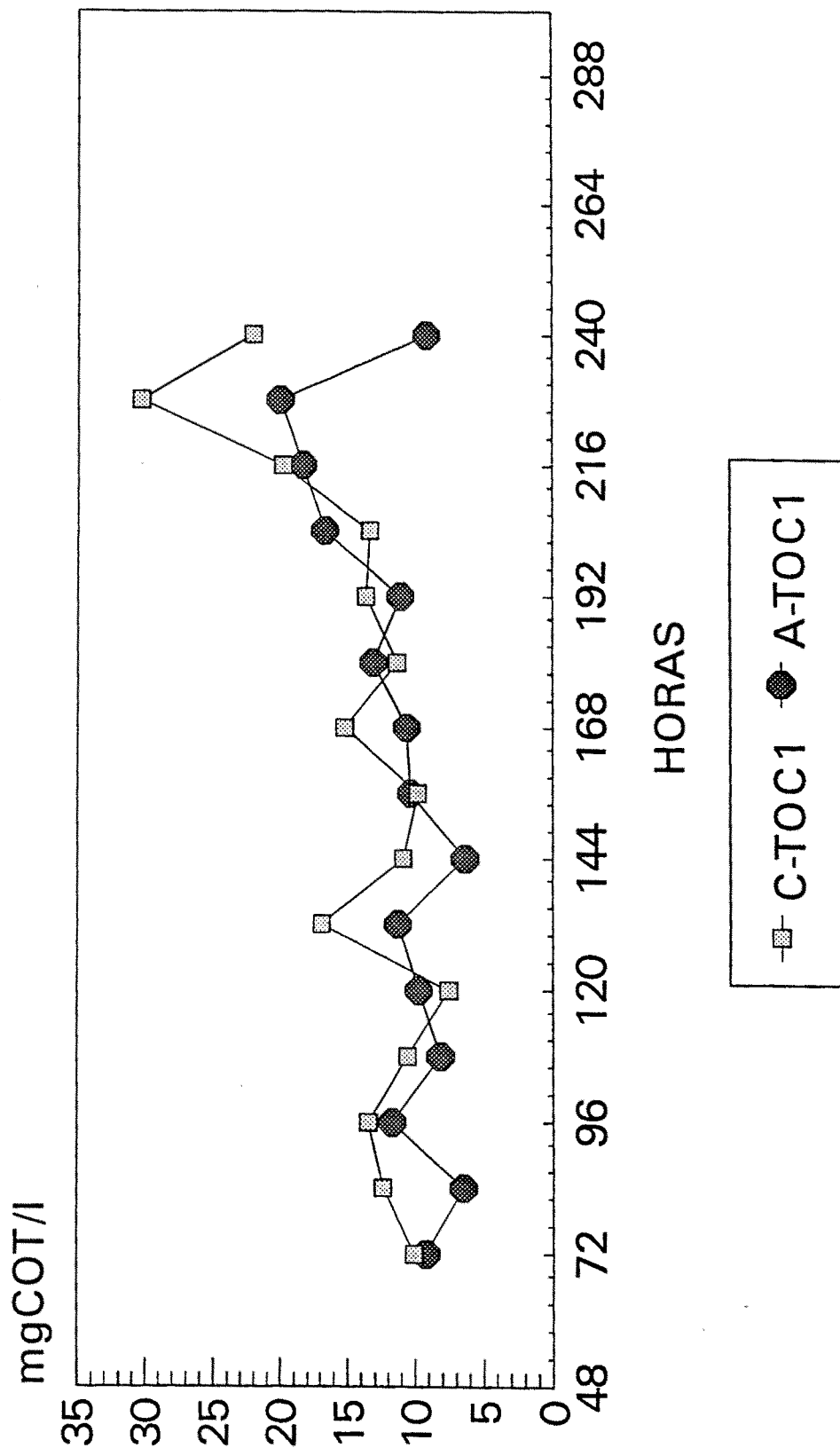
## Experimento 1



Efluente

# DESARROLLO BIOPELICULA

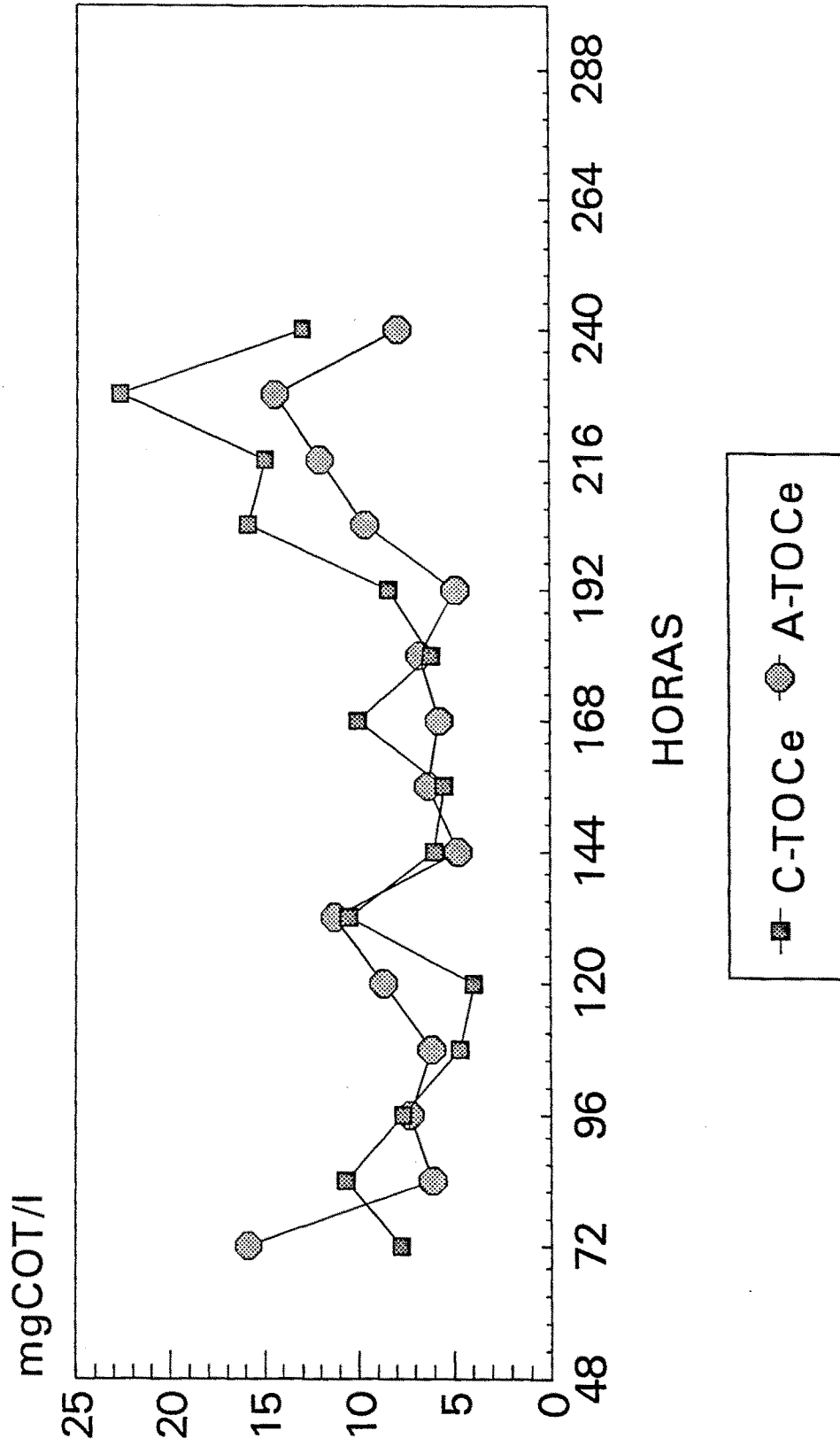
## Experimento 2



Etapa 1

# DESARROLLO BIOPELICULA

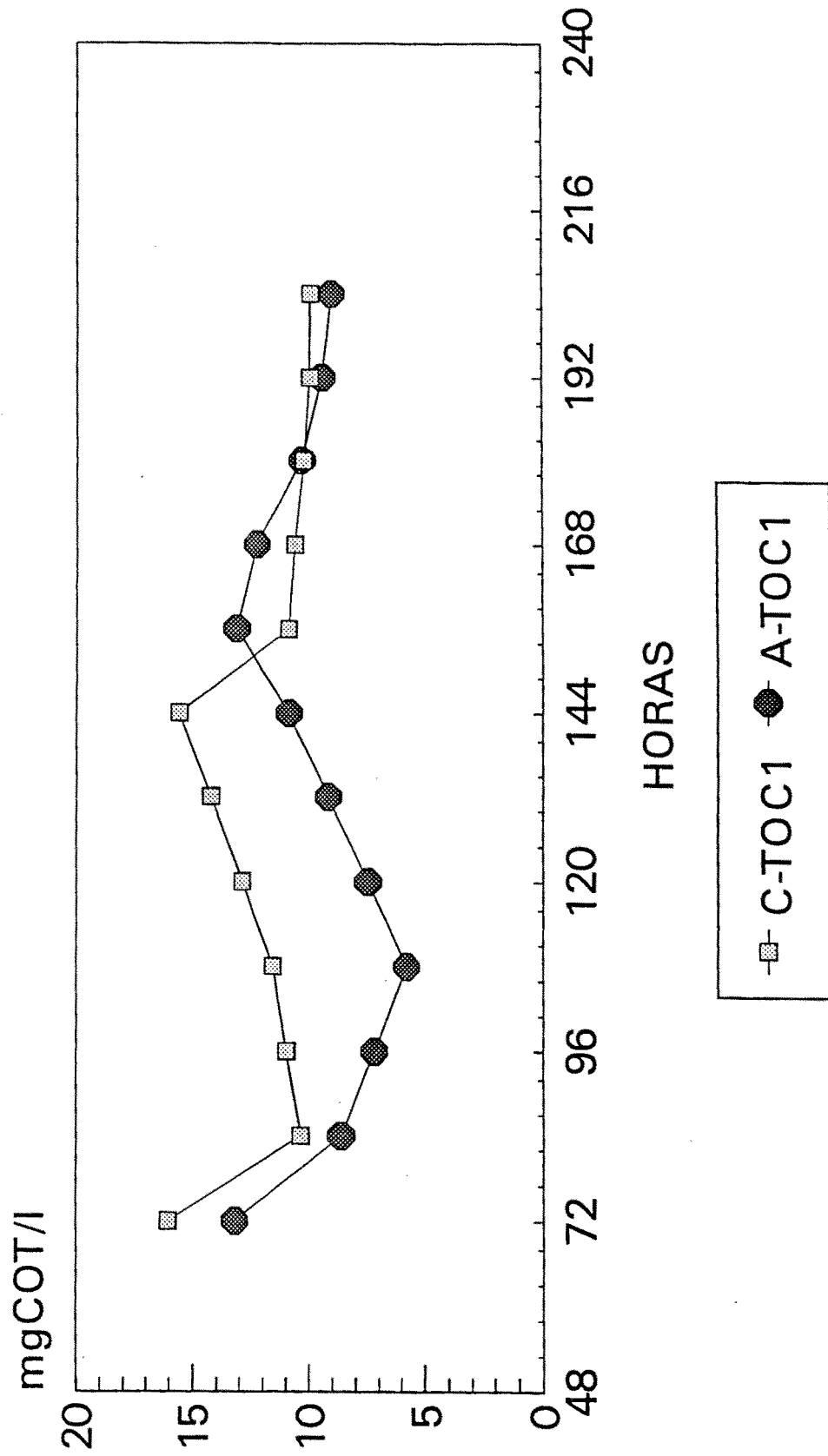
## Experimento 2



Efluente

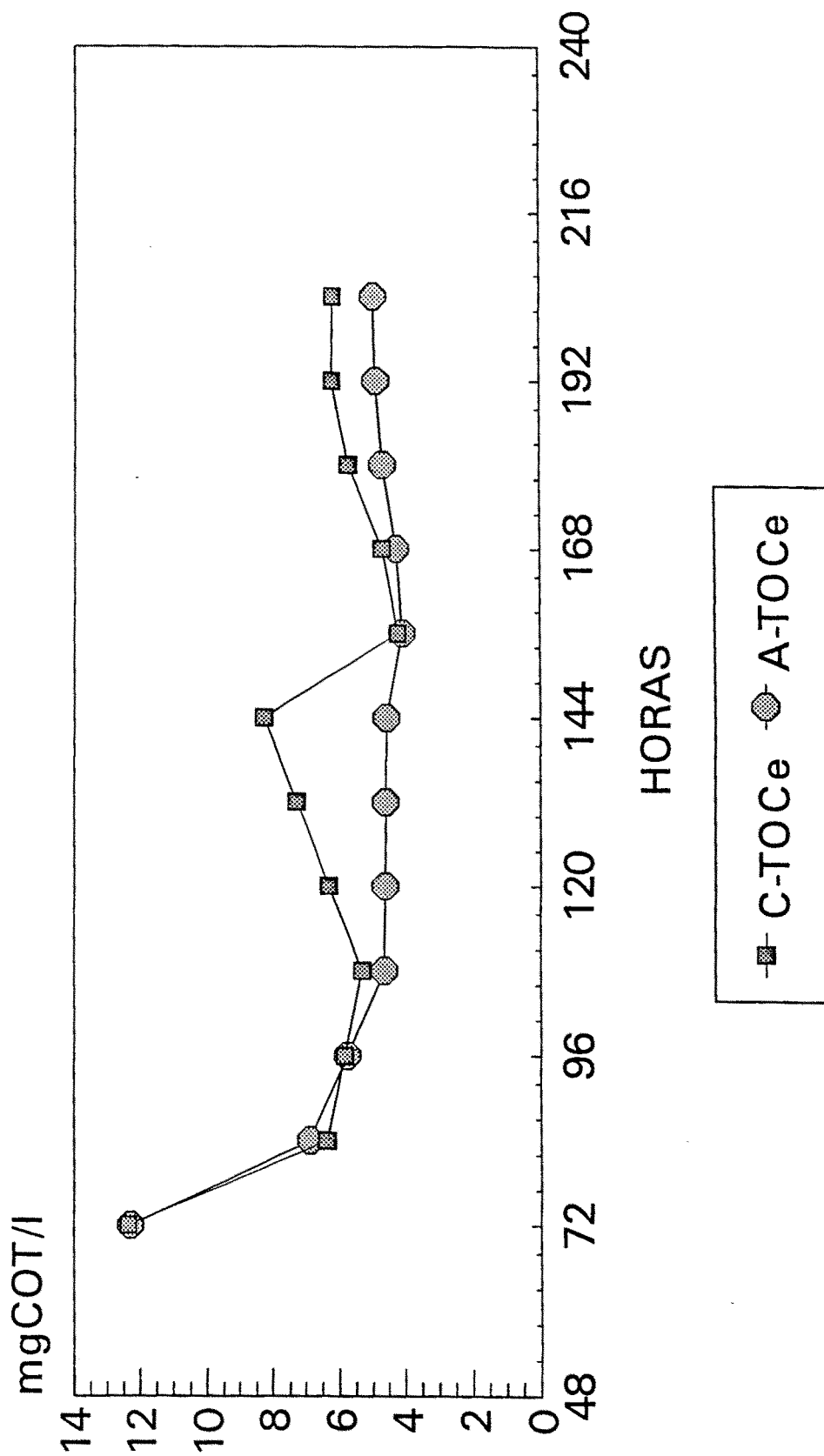
# DESARROLLO BIOPELICULA

## Experimento 3



# DESARROLLO BIOPELICULA

## Experimento 3

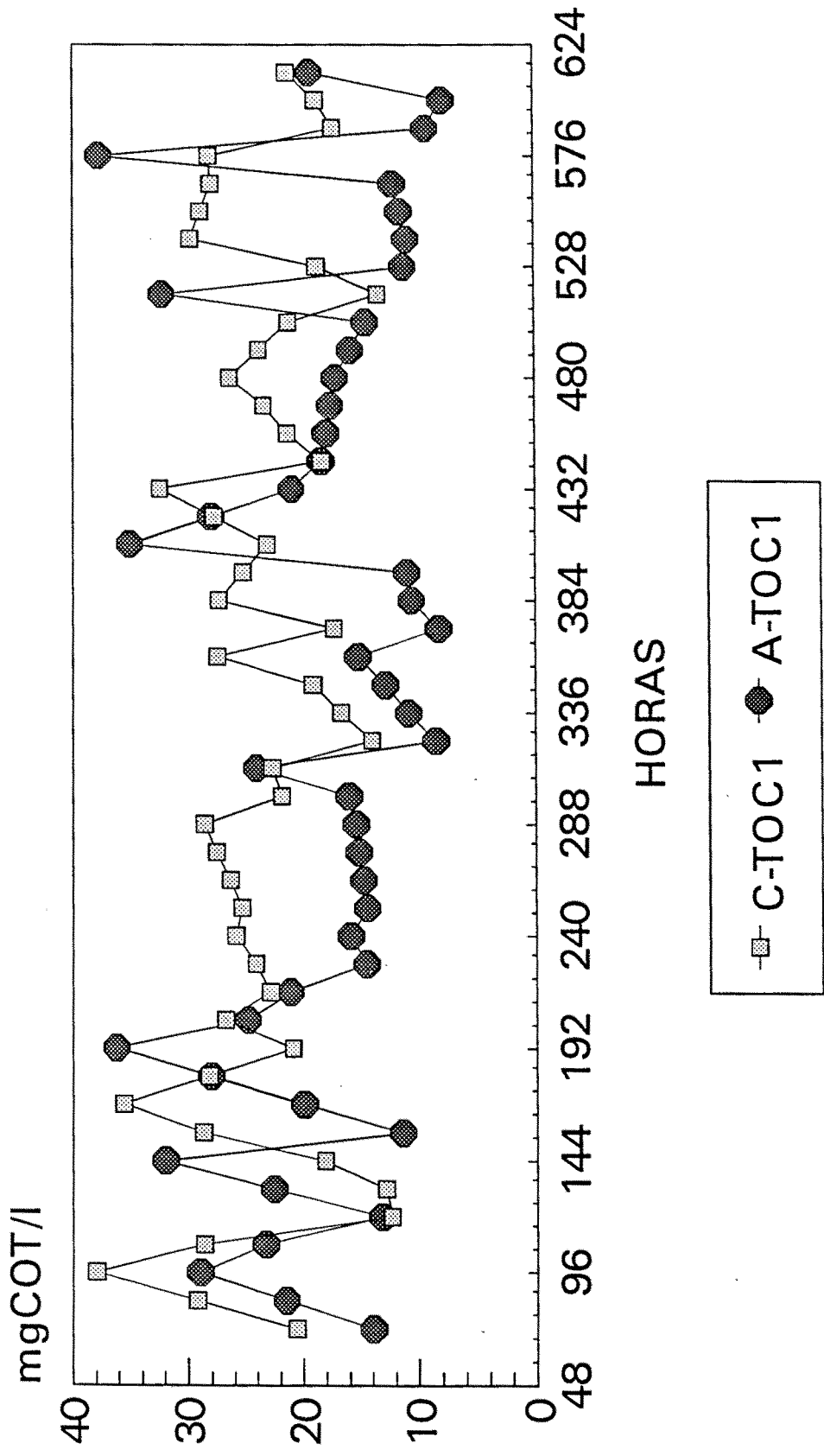


Efluente



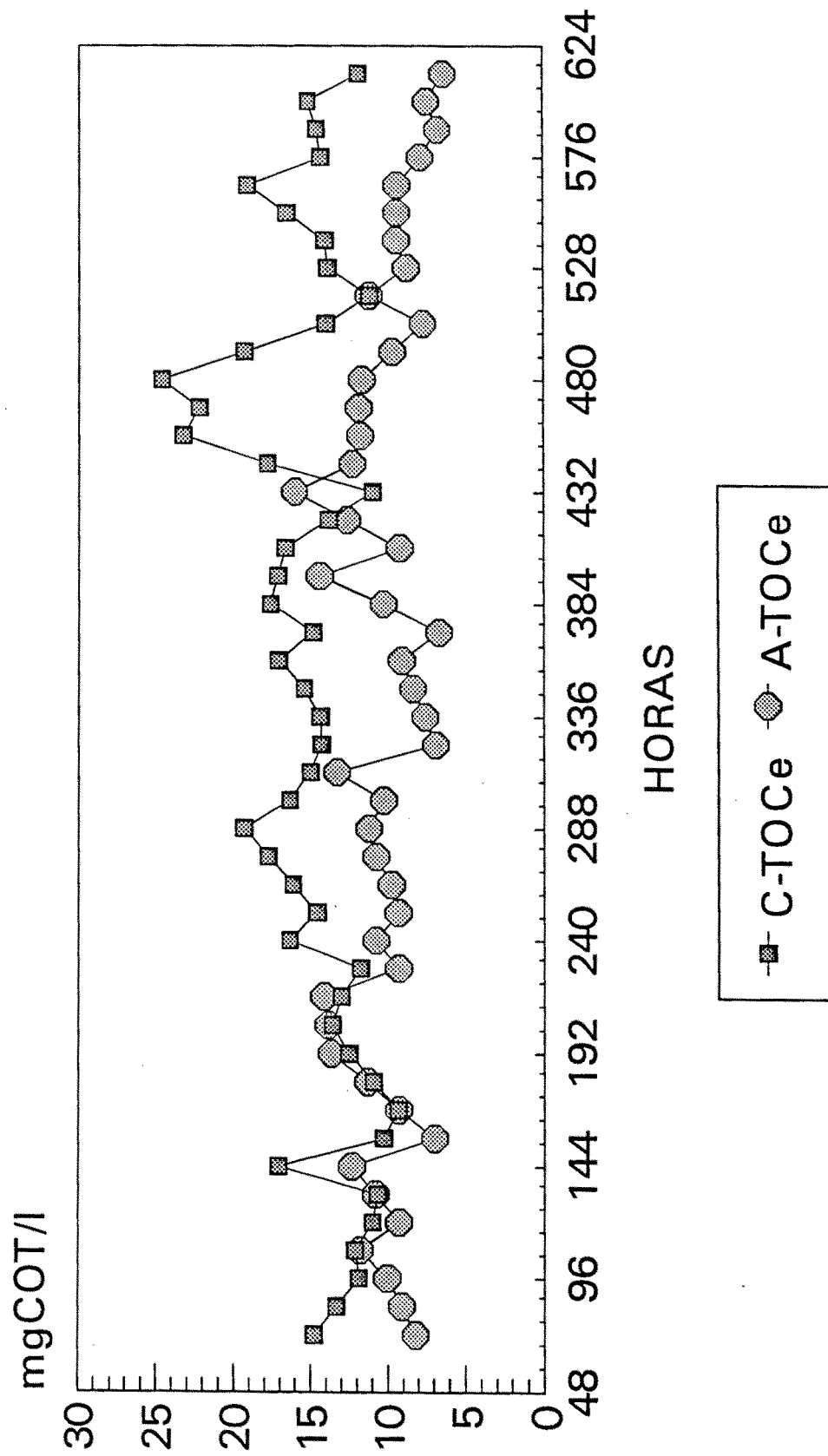
# DESARROLLO BIOPELICULA

## Experimento 4



# DESARROLLO BIOPELICULA

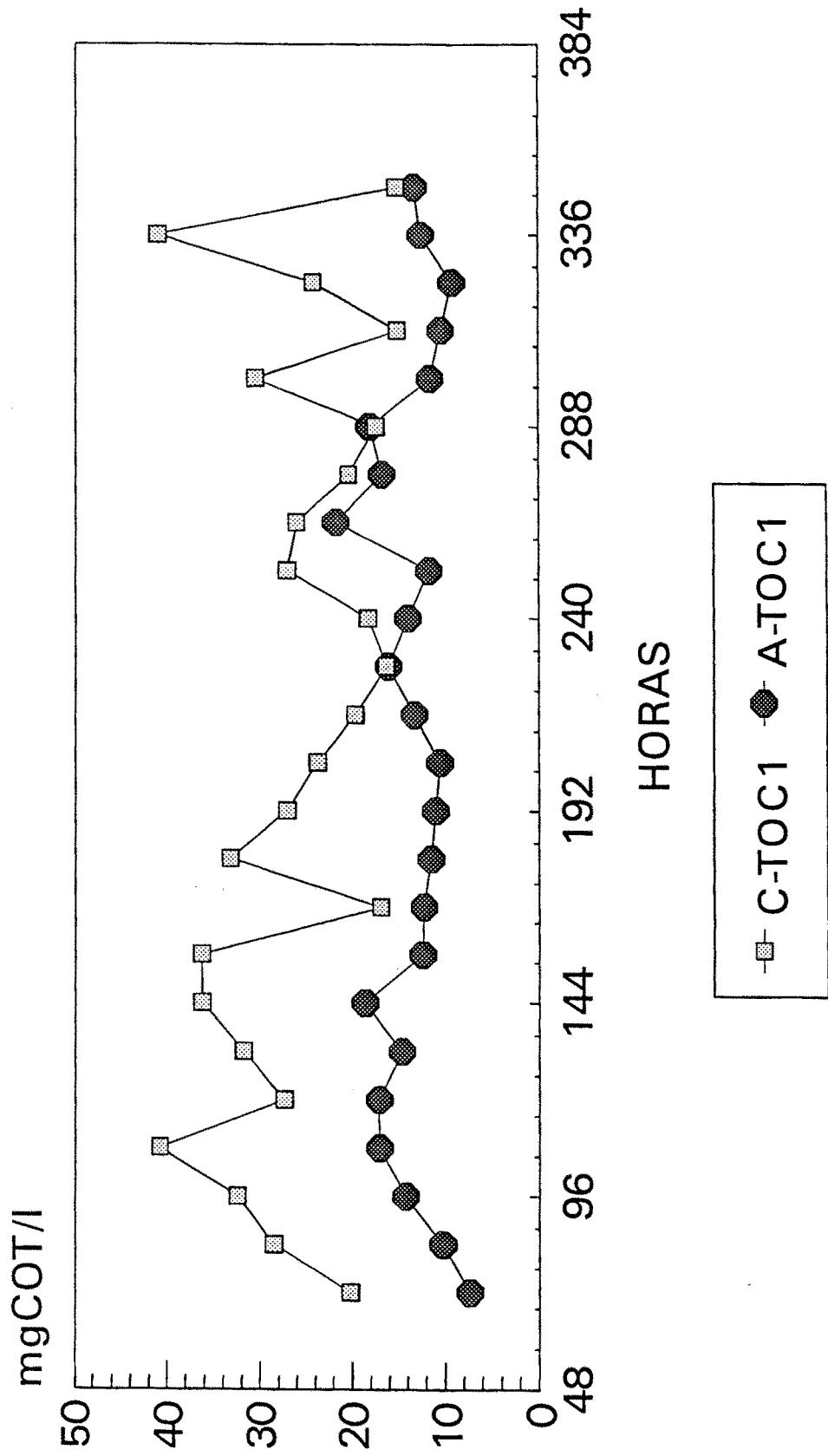
## Experimento 4



Efluente

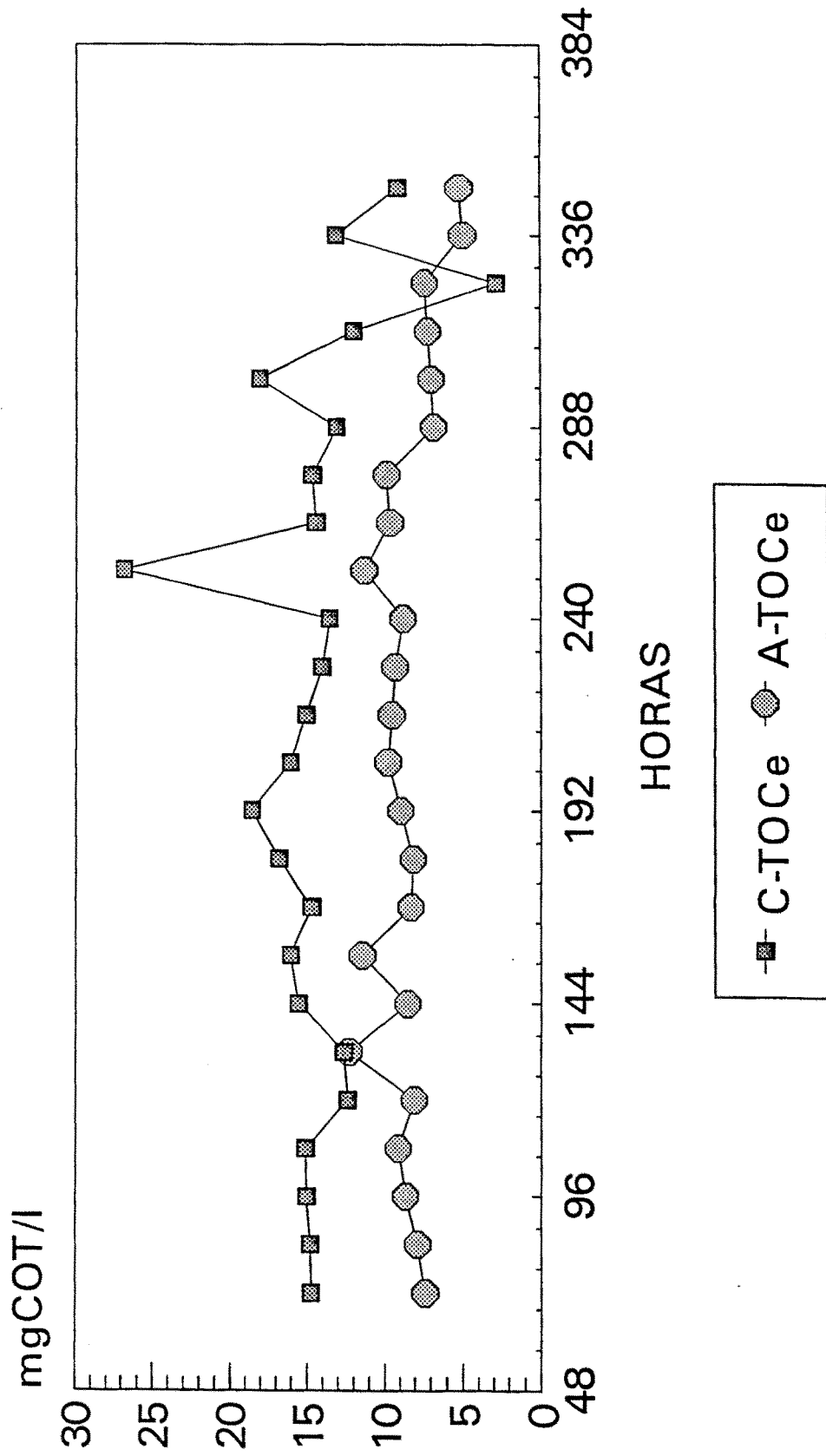
# DESARROLLO BIOPELICULA

## Experimento 5



# DESARROLLO BIOPELICULA

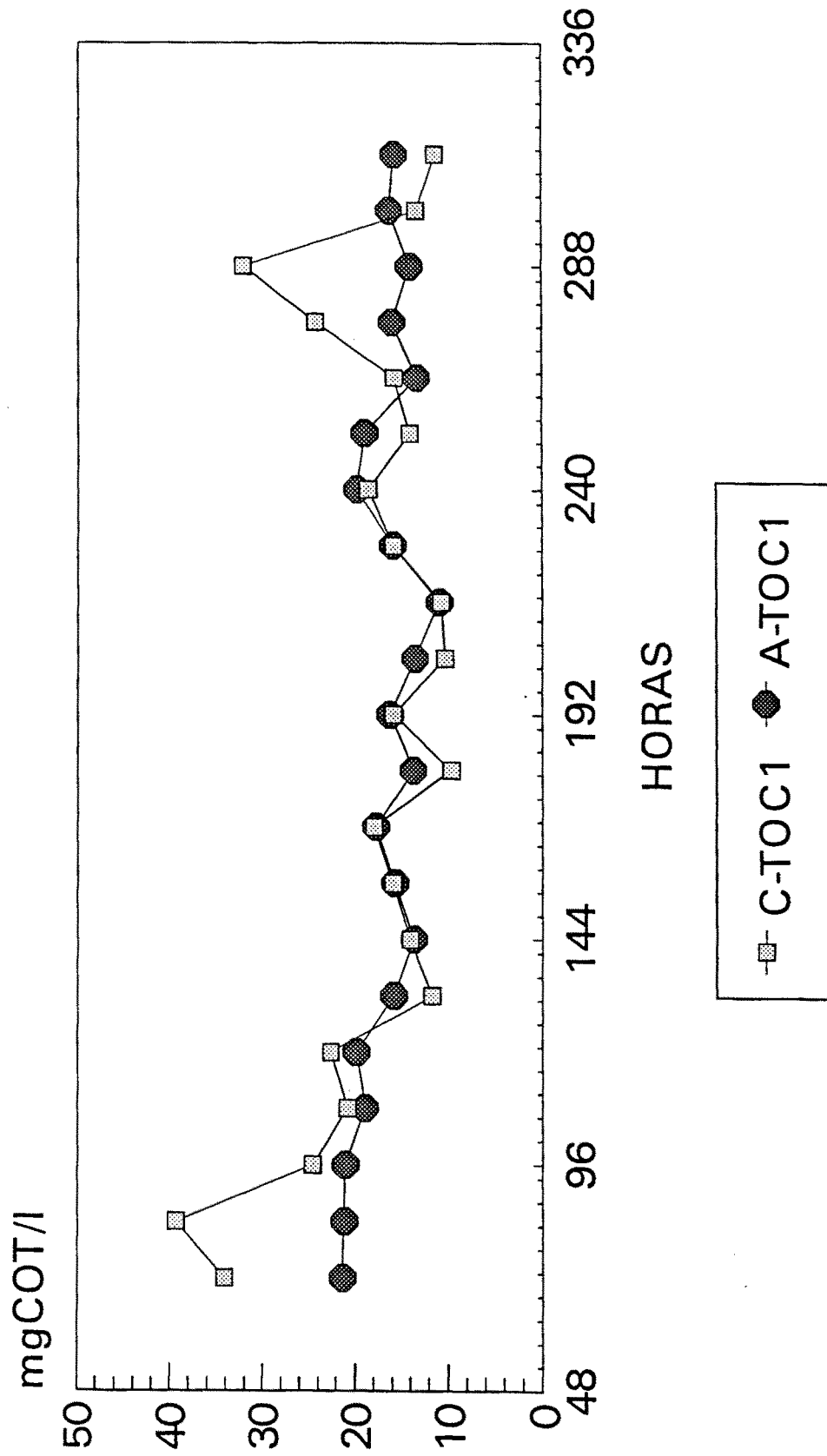
## Experimento 5



Efluente

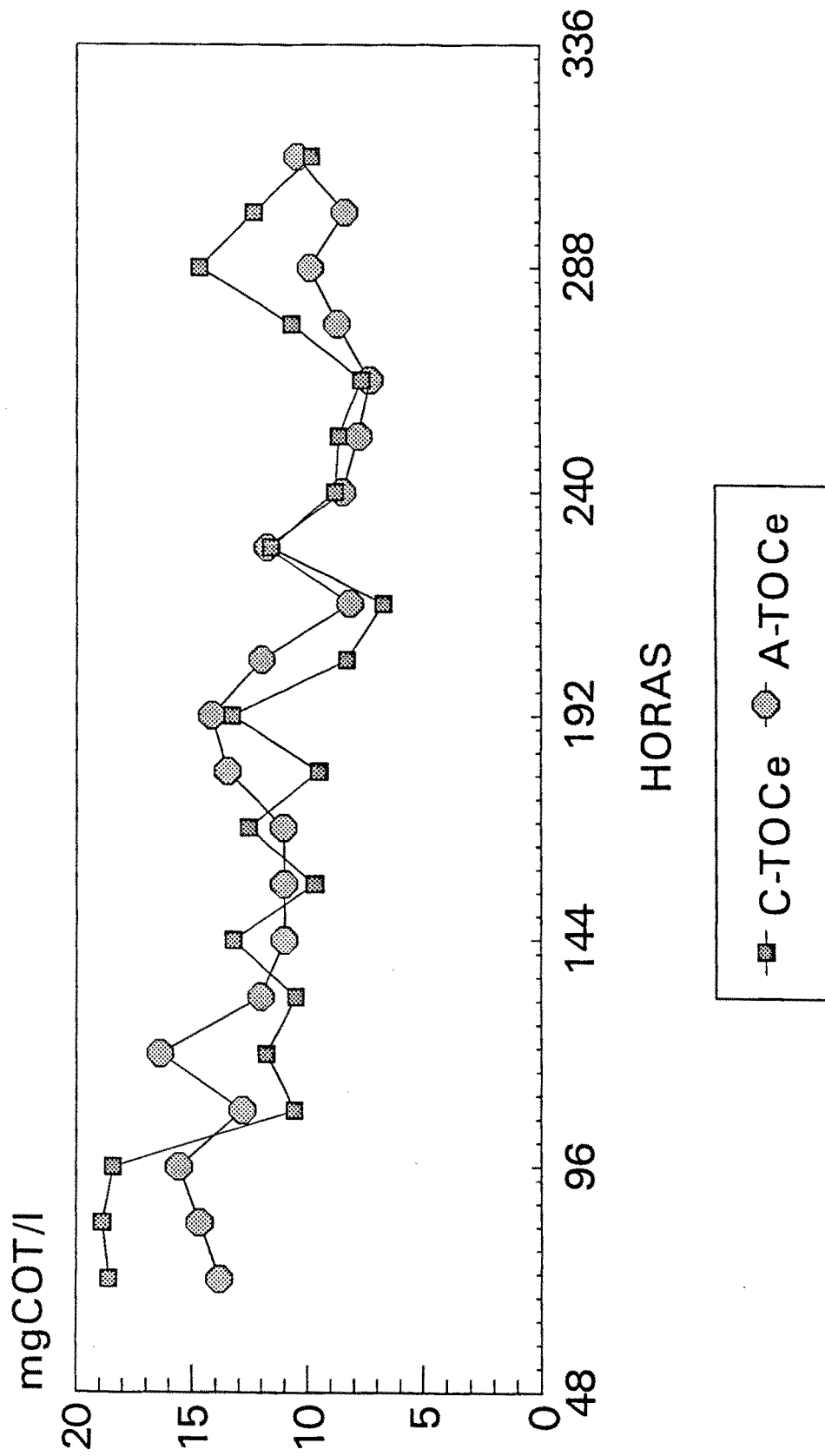
# DESARROLLO BIOPELICULA

## Experimento 6



# DESARROLLO BIOPELICULA

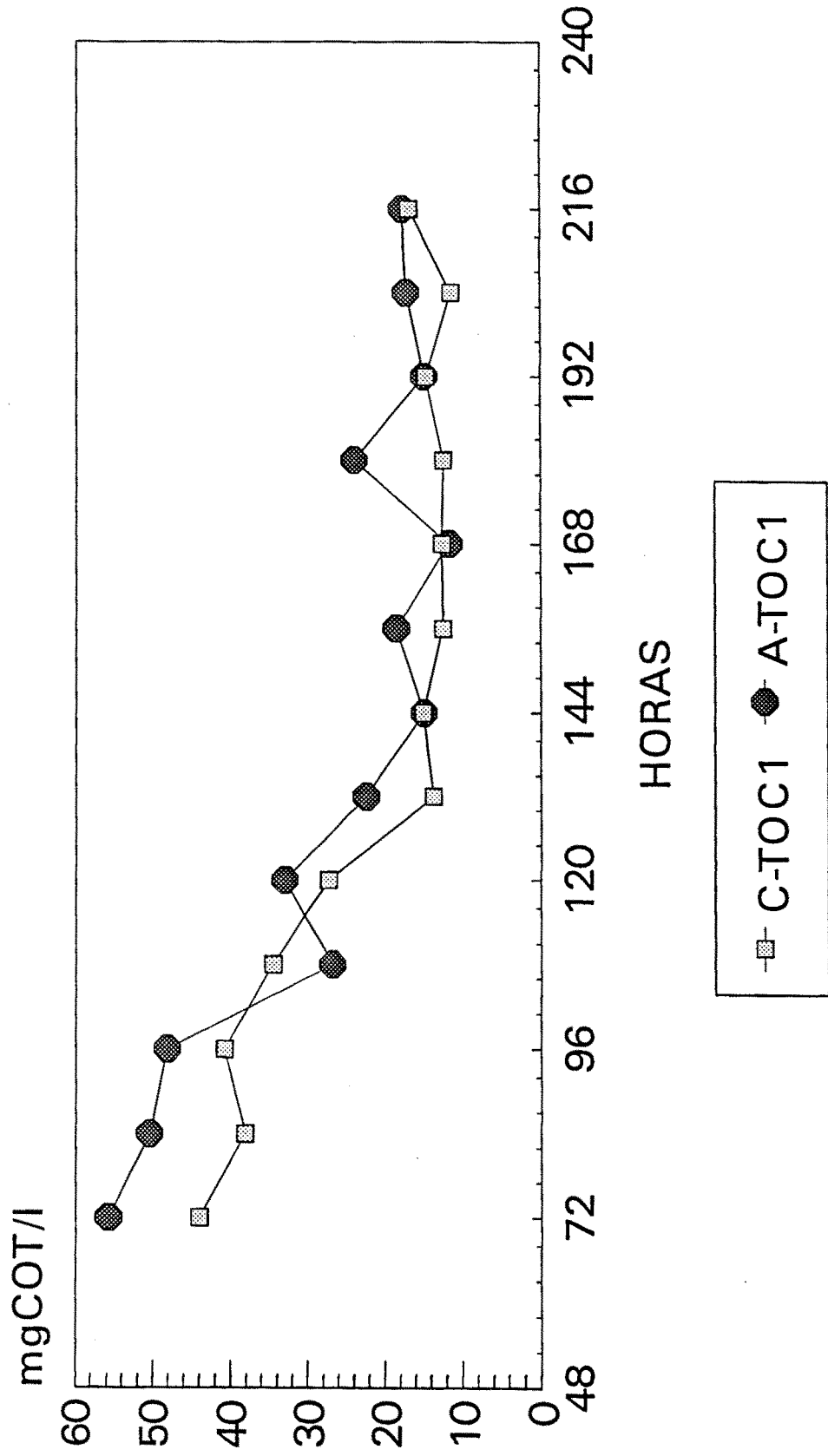
## Experimento 6



Efluente

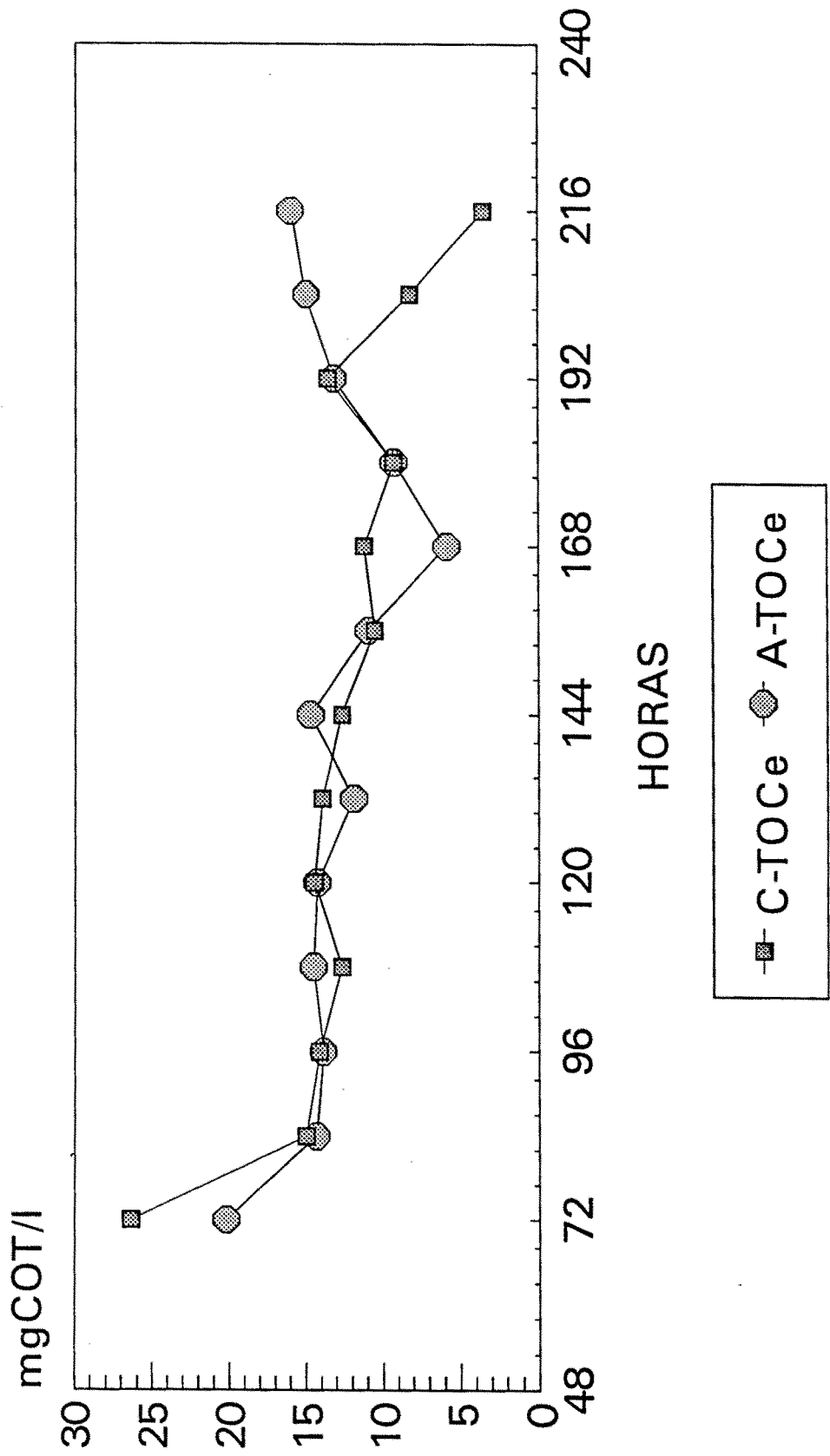
# DESARROLLO BIOPELICULA

## Experimento 7



# DESARROLLO BIOPELICULA

## Experimento 7

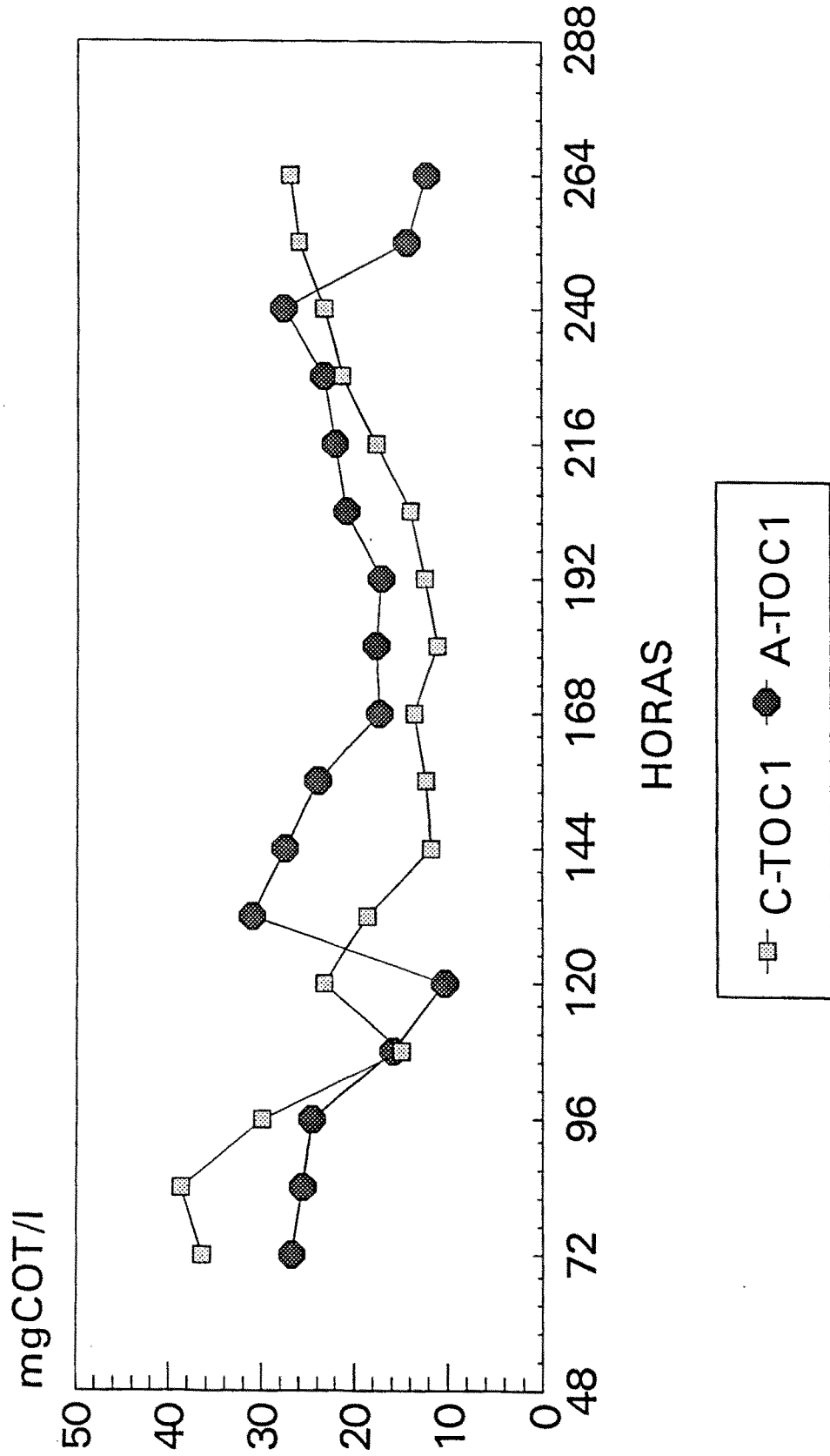


Efluente



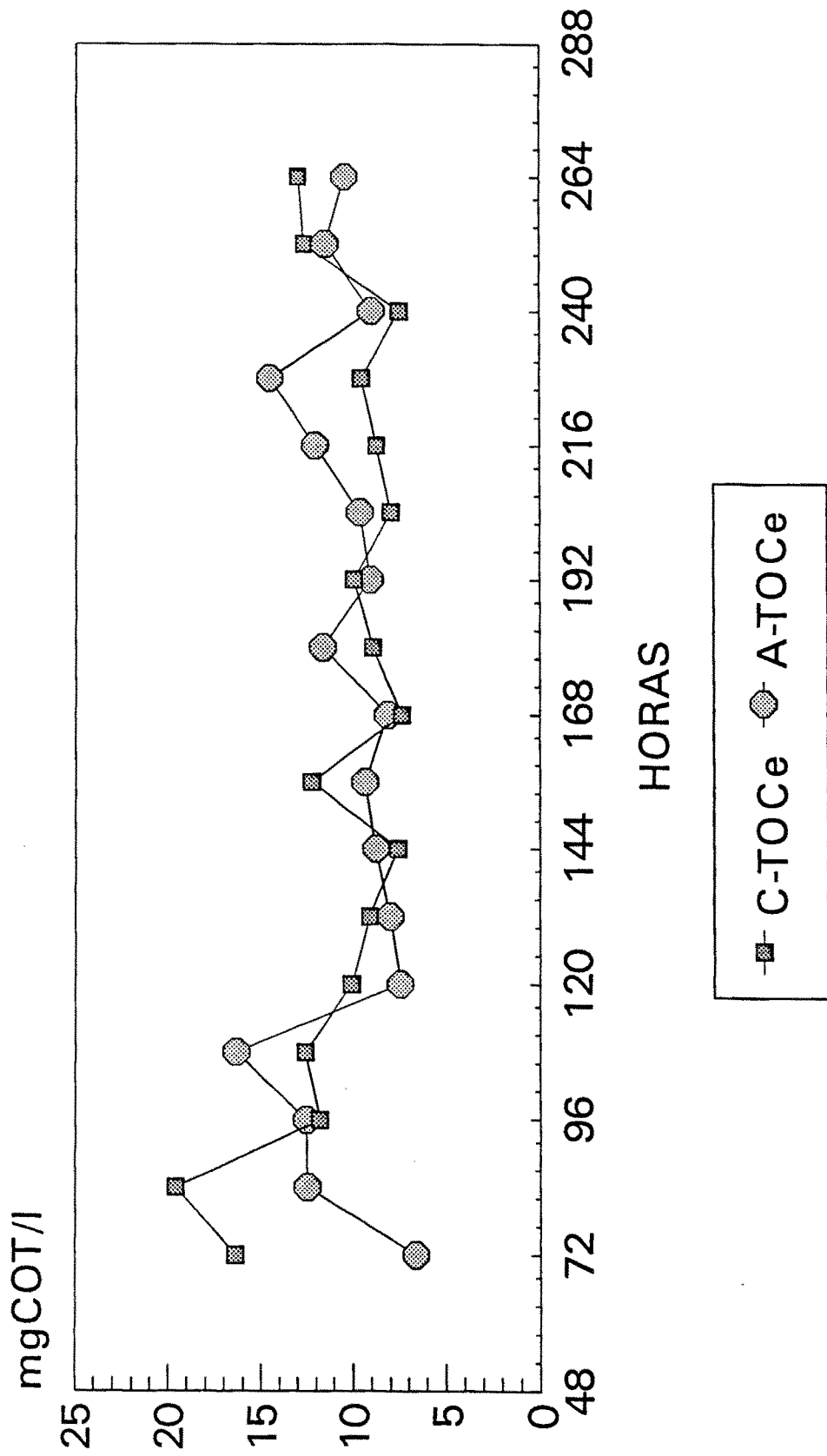
# DESARROLLO BIOPELICULA

## Experimento 8



# DESARROLLO BIOPELICULA

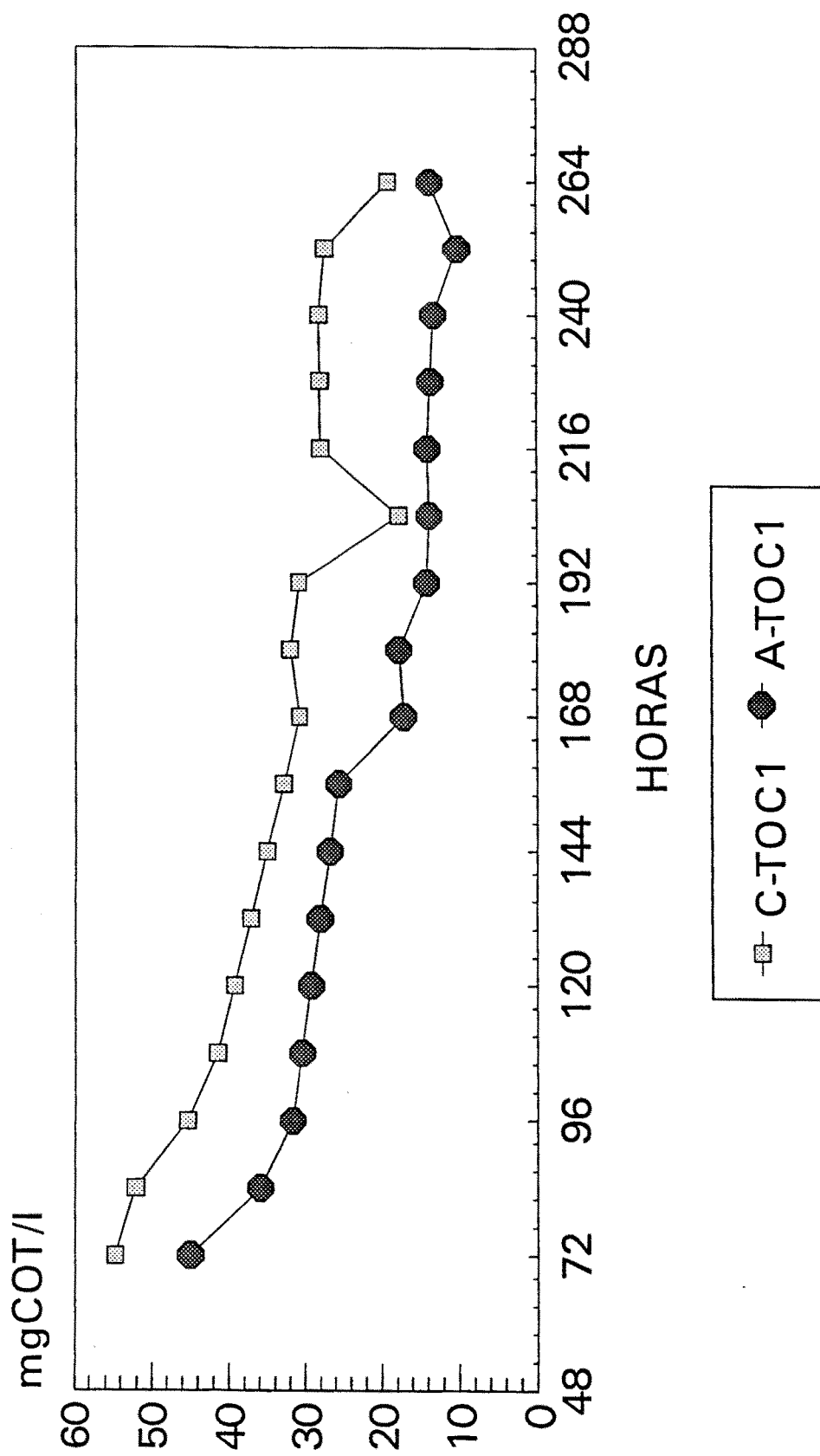
## Experimento 8



Efluente

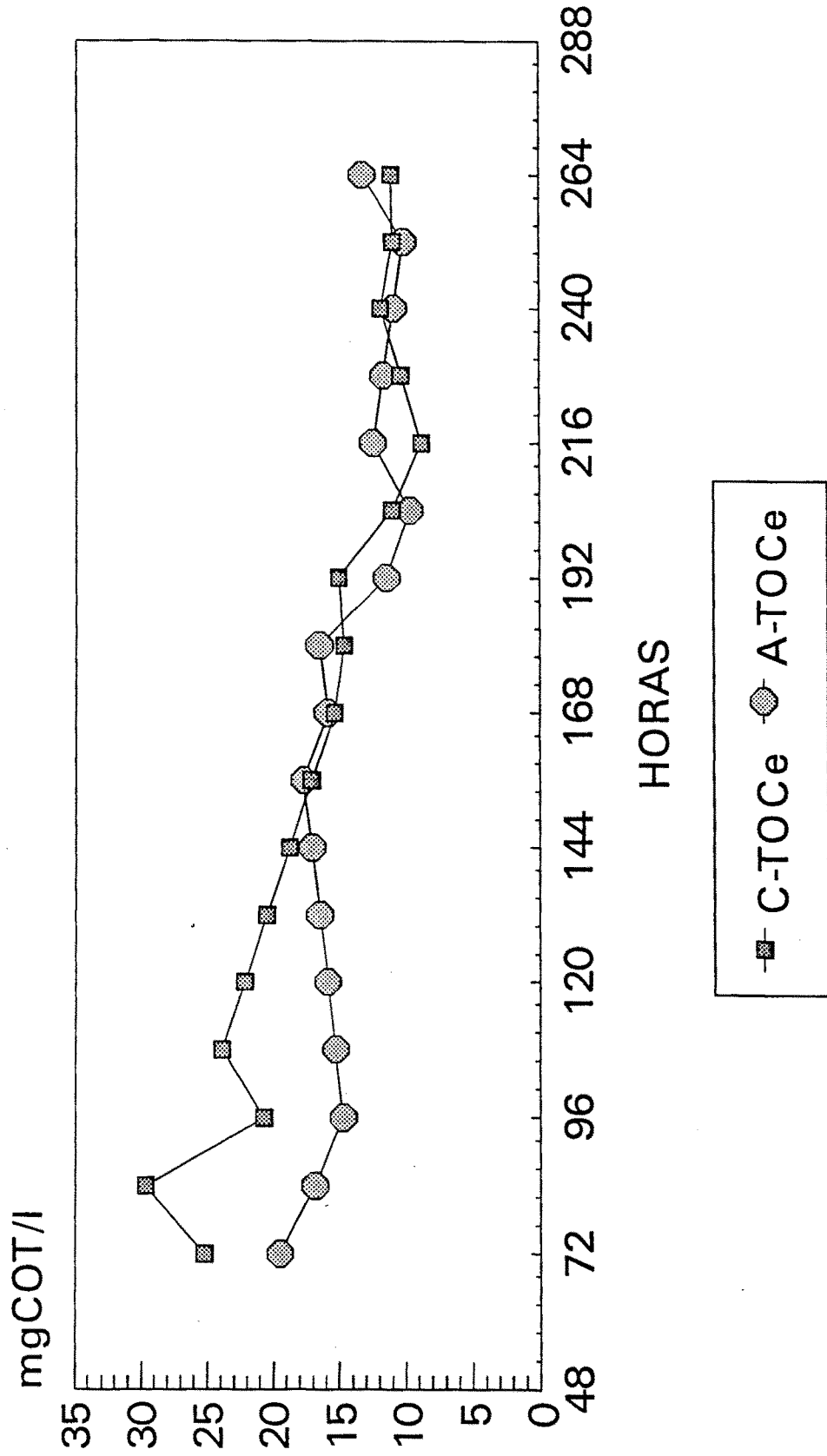
# DESARROLLO BIOPELICULA

## Experimento 9



# DESARROLLO BIOPELICULA

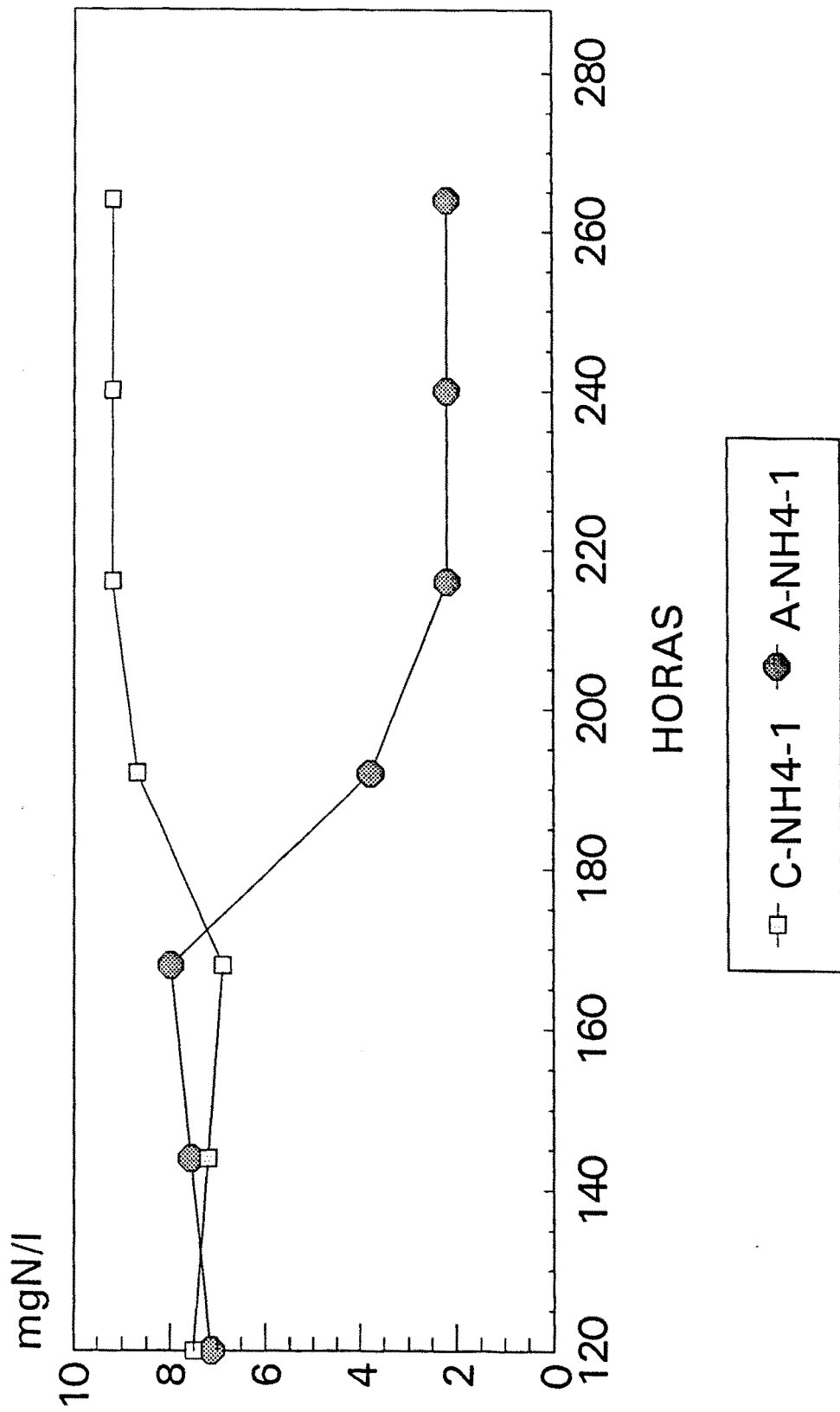
## Experimento 9



Efluente

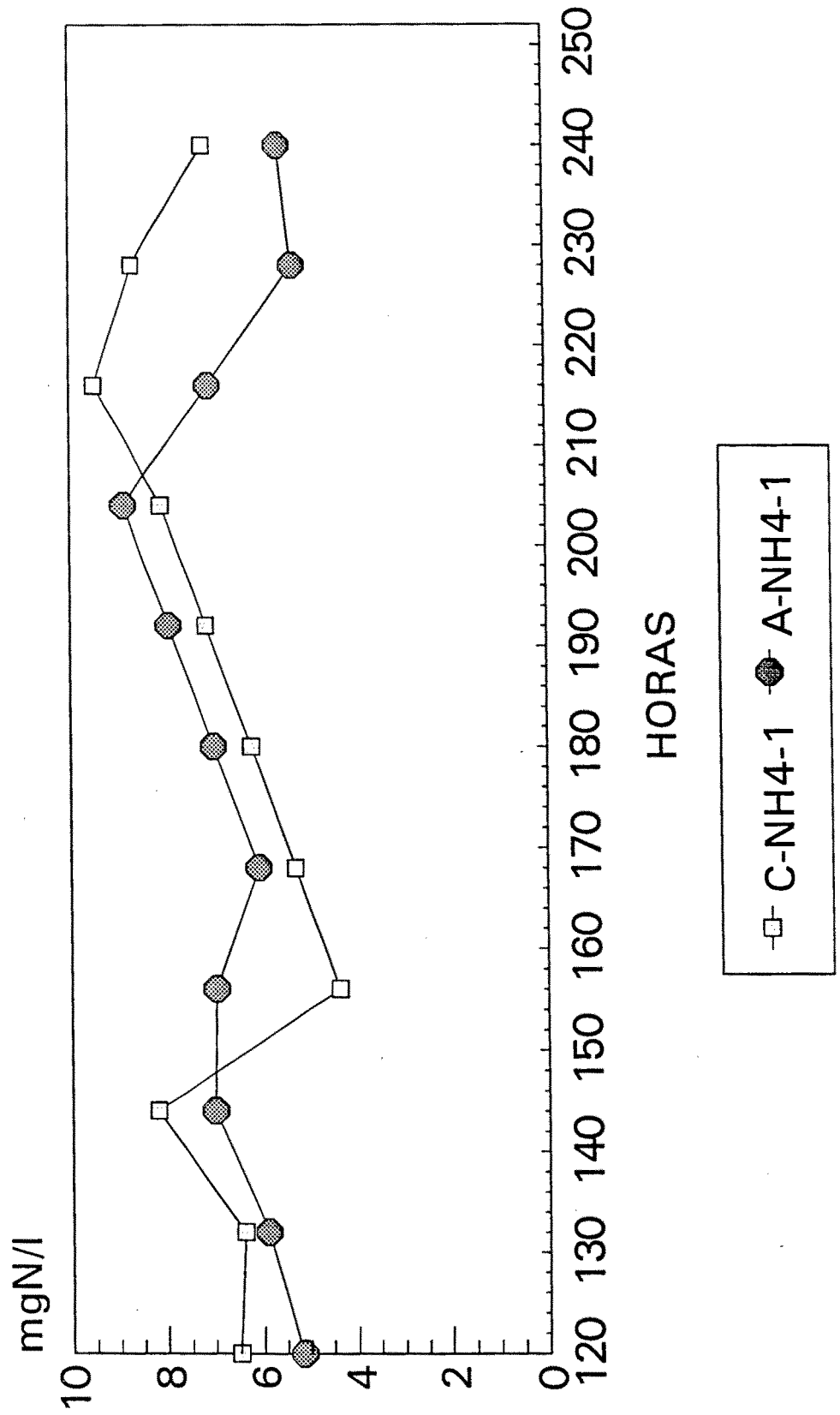
# DESARROLLO DE LA BIOPELICULA

## Experimento 1



# DESARROLLO DE LA BIOPELICULA

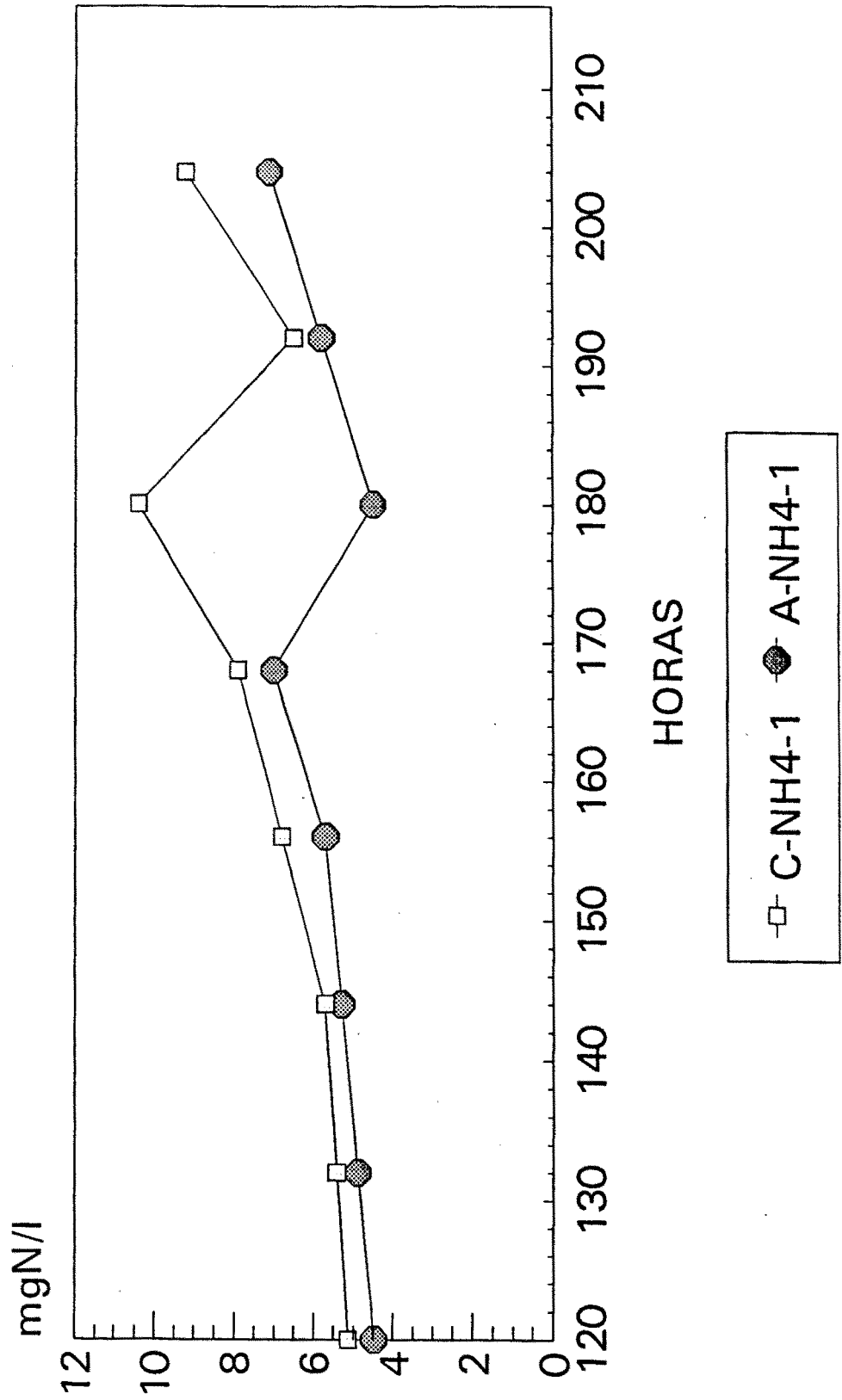
## Experimento 2



Etapa 1

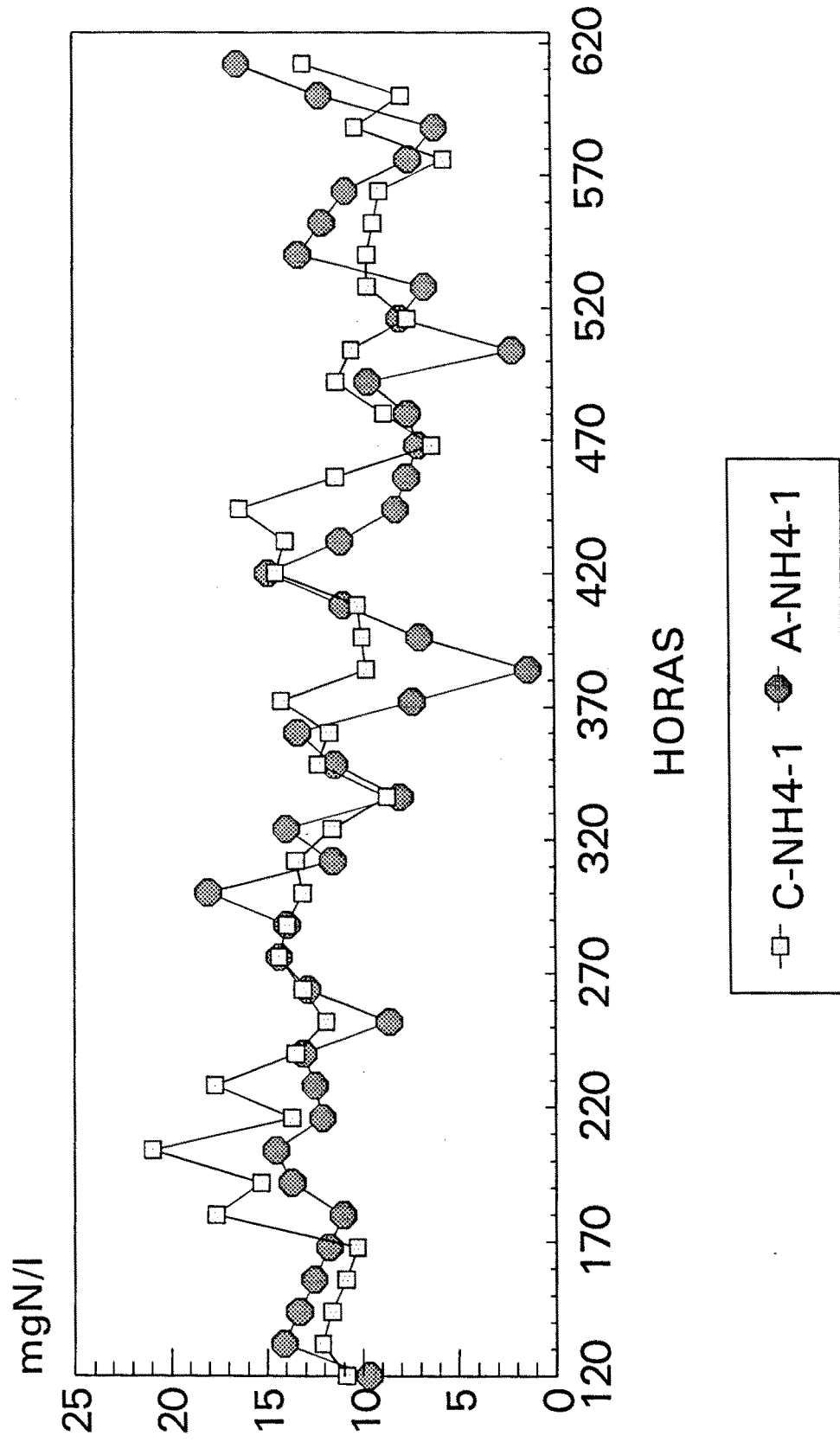
# DESARROLLO DE LA BIOPELICULA

## Experimento 3



# DESARROLLO DE LA BIOPELICULA

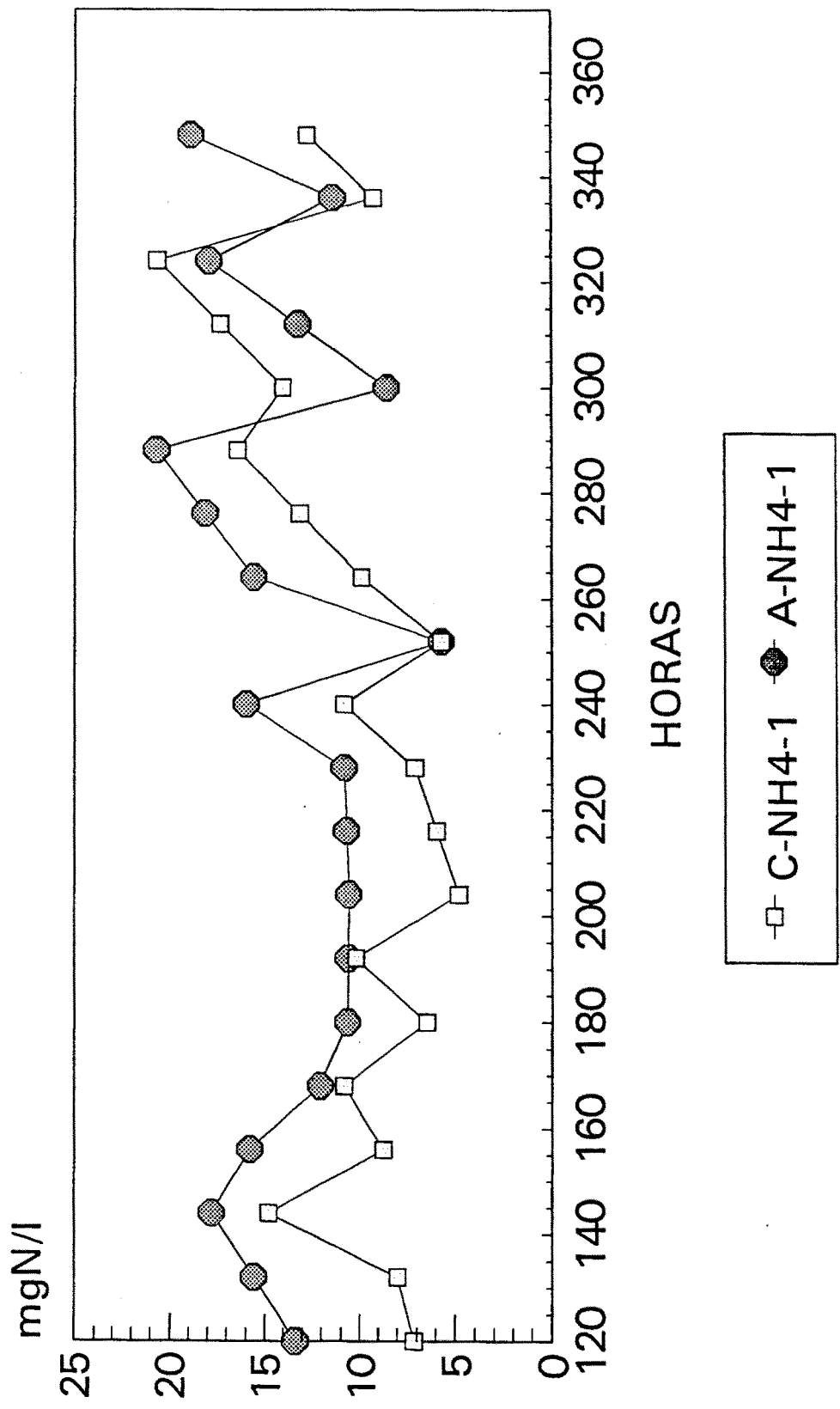
## Experimento 4





# DESARROLLO DE LA BIOPELICULA

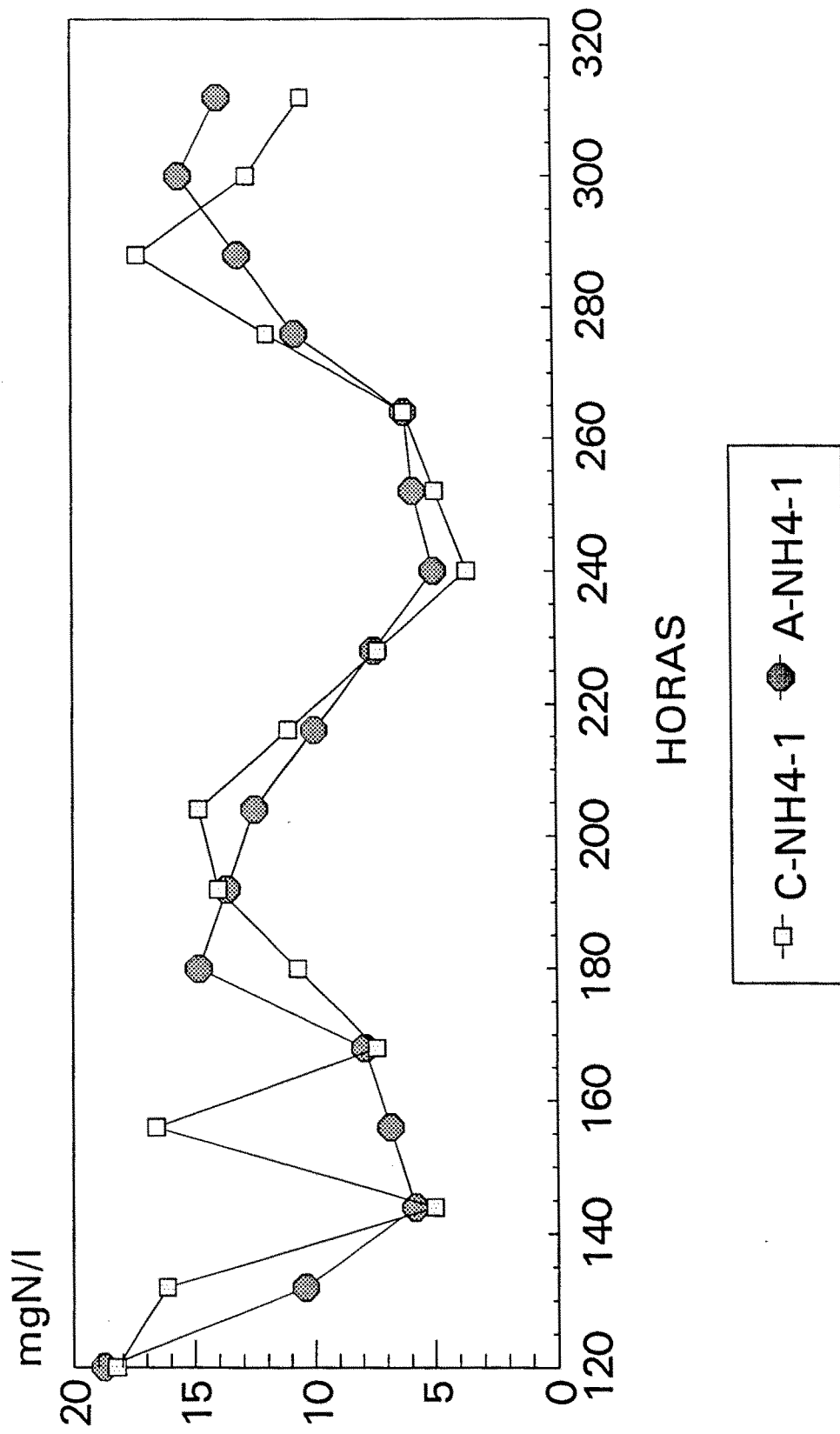
## Experimento 5



A2-41

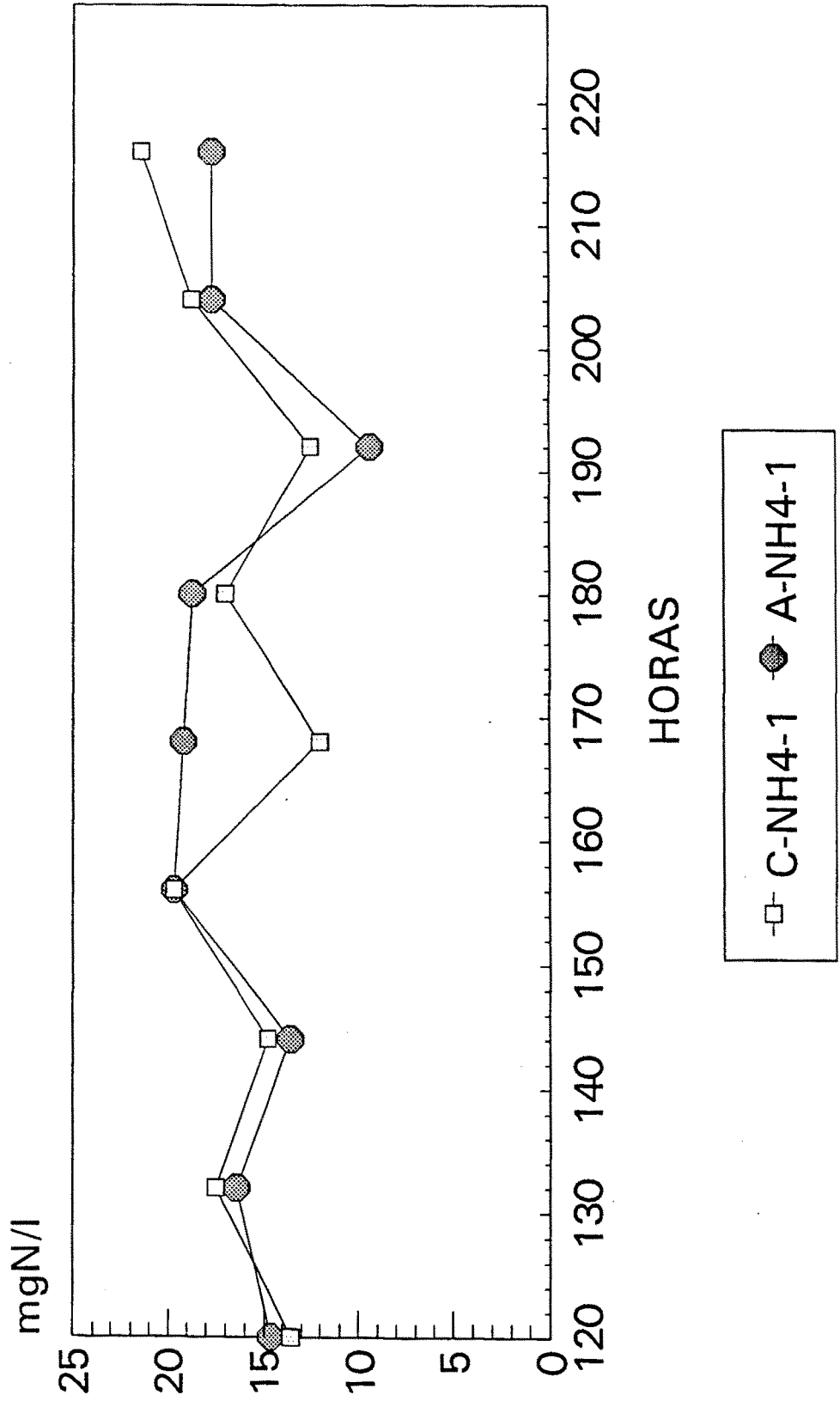
# DESARROLLO DE LA BIOPELICULA

## Experimento 6



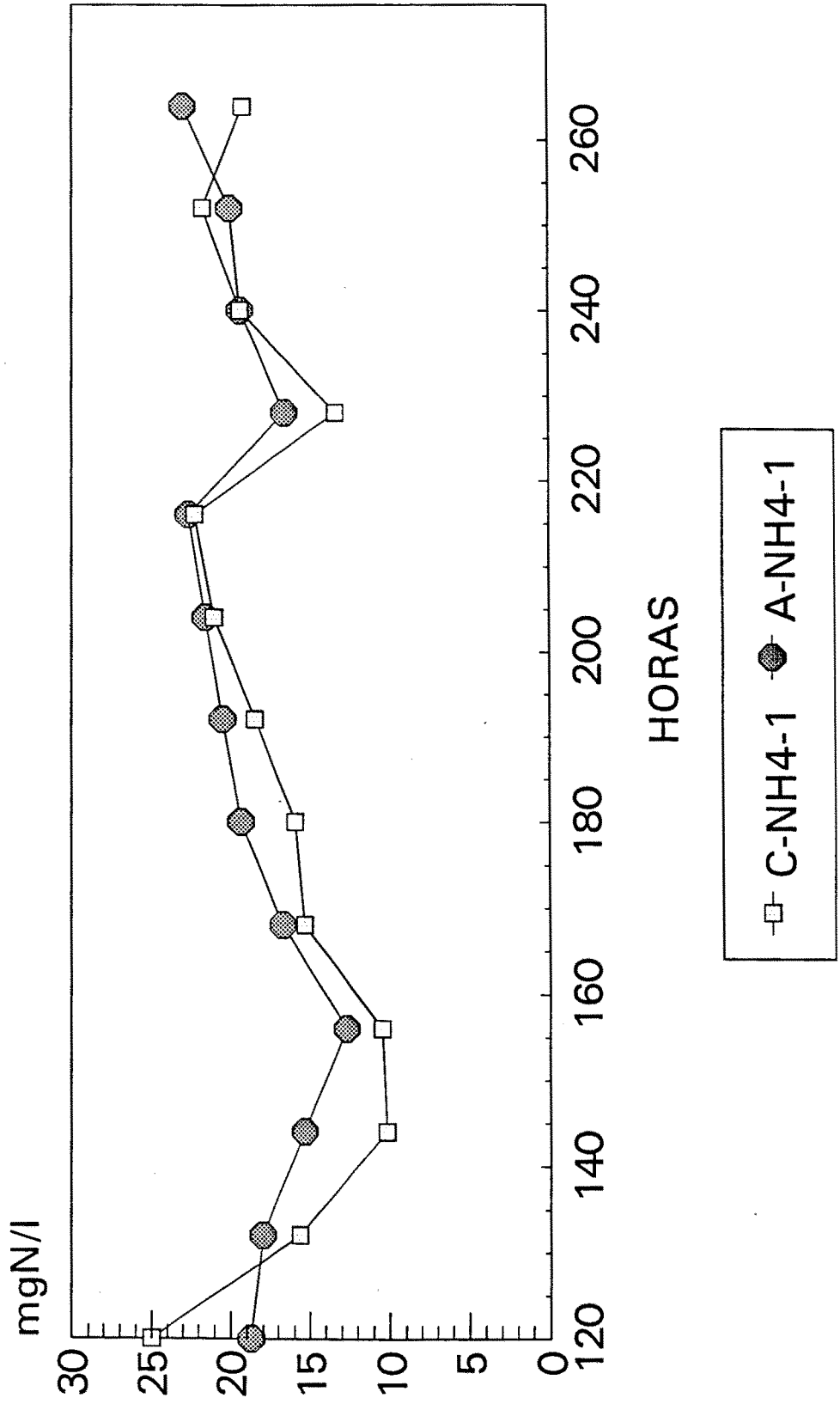
# DESARROLLO DE LA BIOPELICULA

## Experimento 7



# DESARROLLO DE LA BIOPELICULA

## Experimento 8

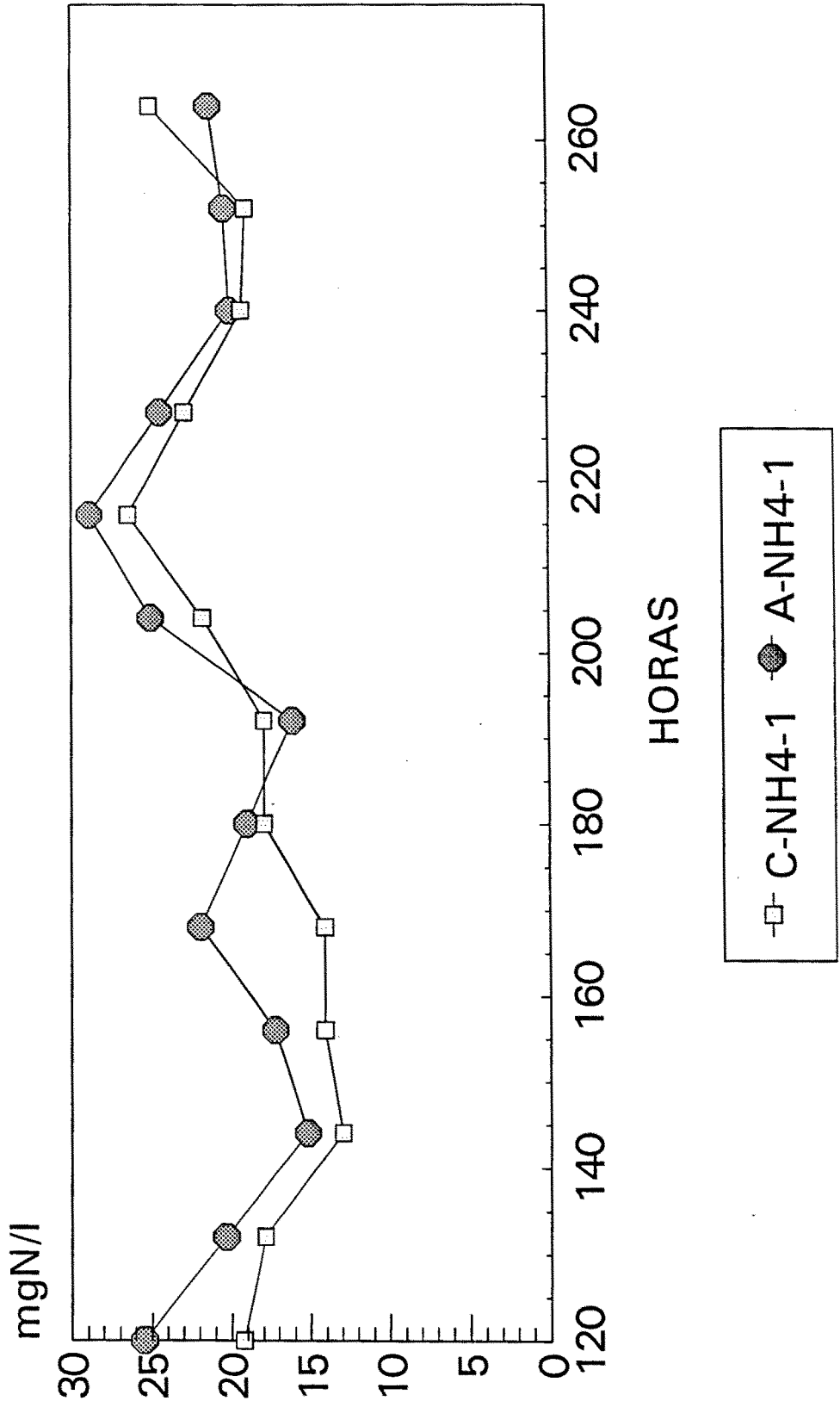


A2-44

Etapa 1

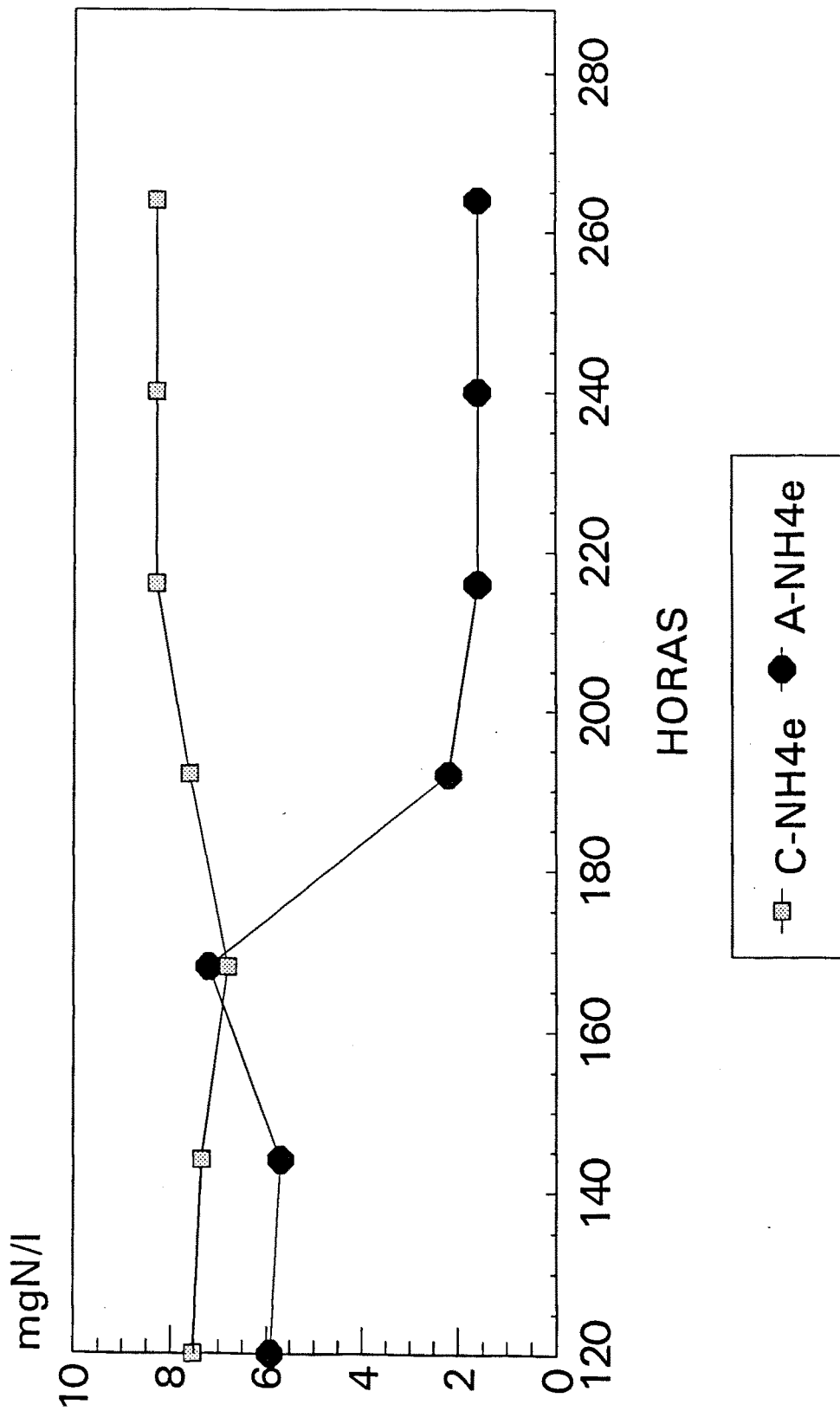
# DESARROLLO DE LA BIOPELICULA

## Experimento 9



# DESARROLLO DE LA BIOPELICULA

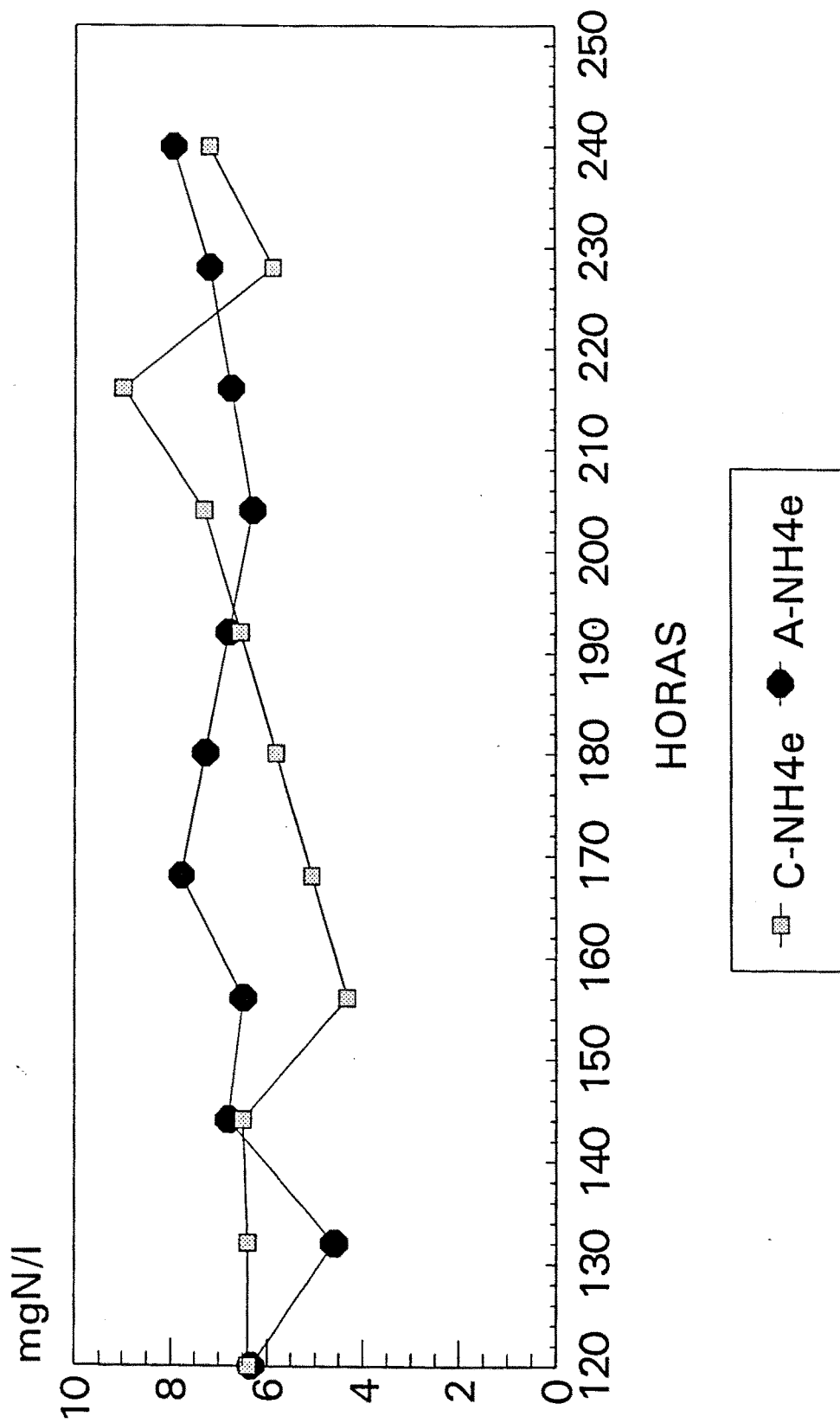
## Experimento 1



Efluente

# DESARROLLO DE LA BIOPELICULA

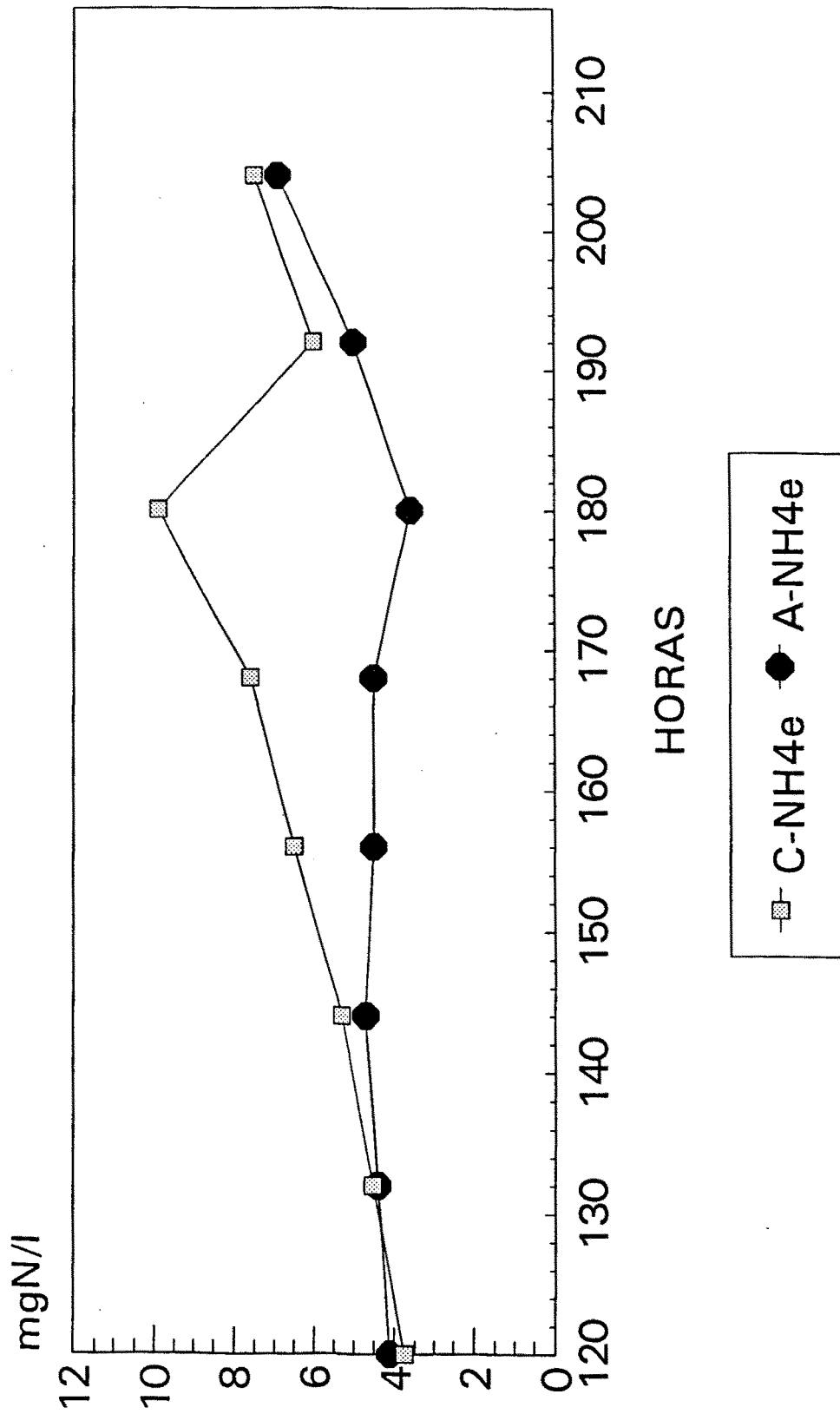
## Experimento 2



Efluente

# DESARROLLO DE LA BIOPELICULA

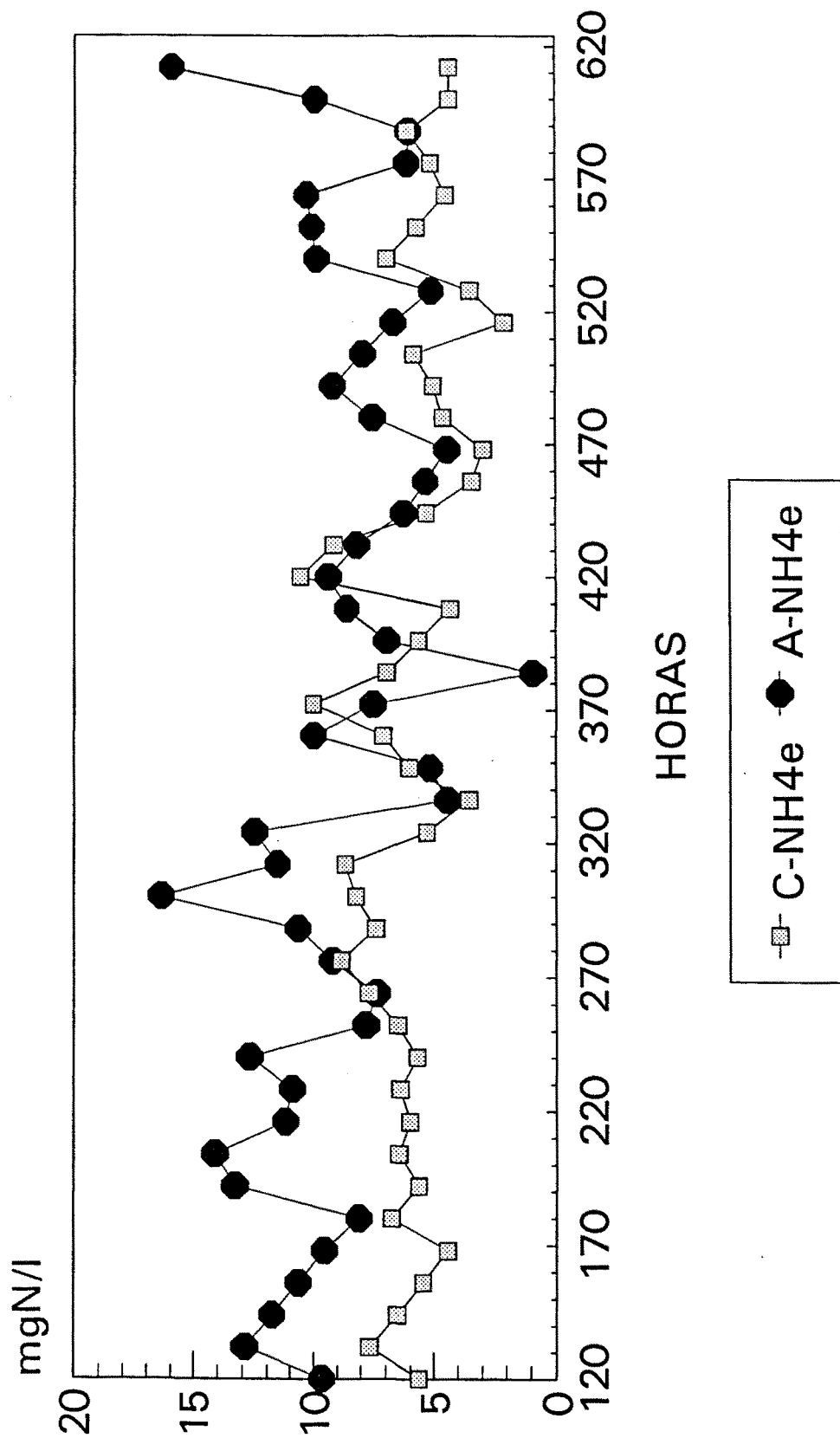
## Experimento 3





# DESARROLLO DE LA BIOPELICULA

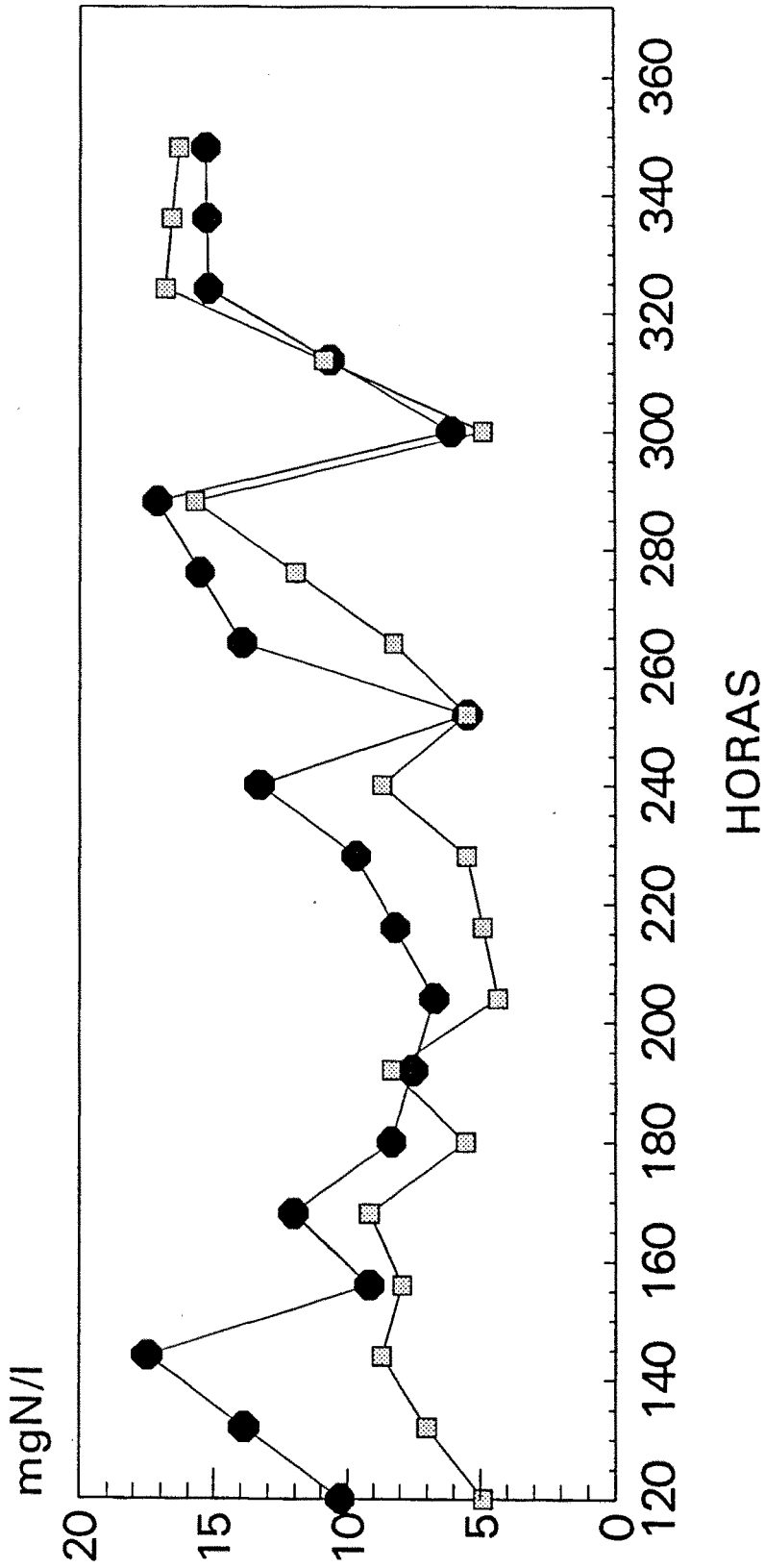
## Experimento 4



Efluente

# DESARROLLO DE LA BIOPELICULA

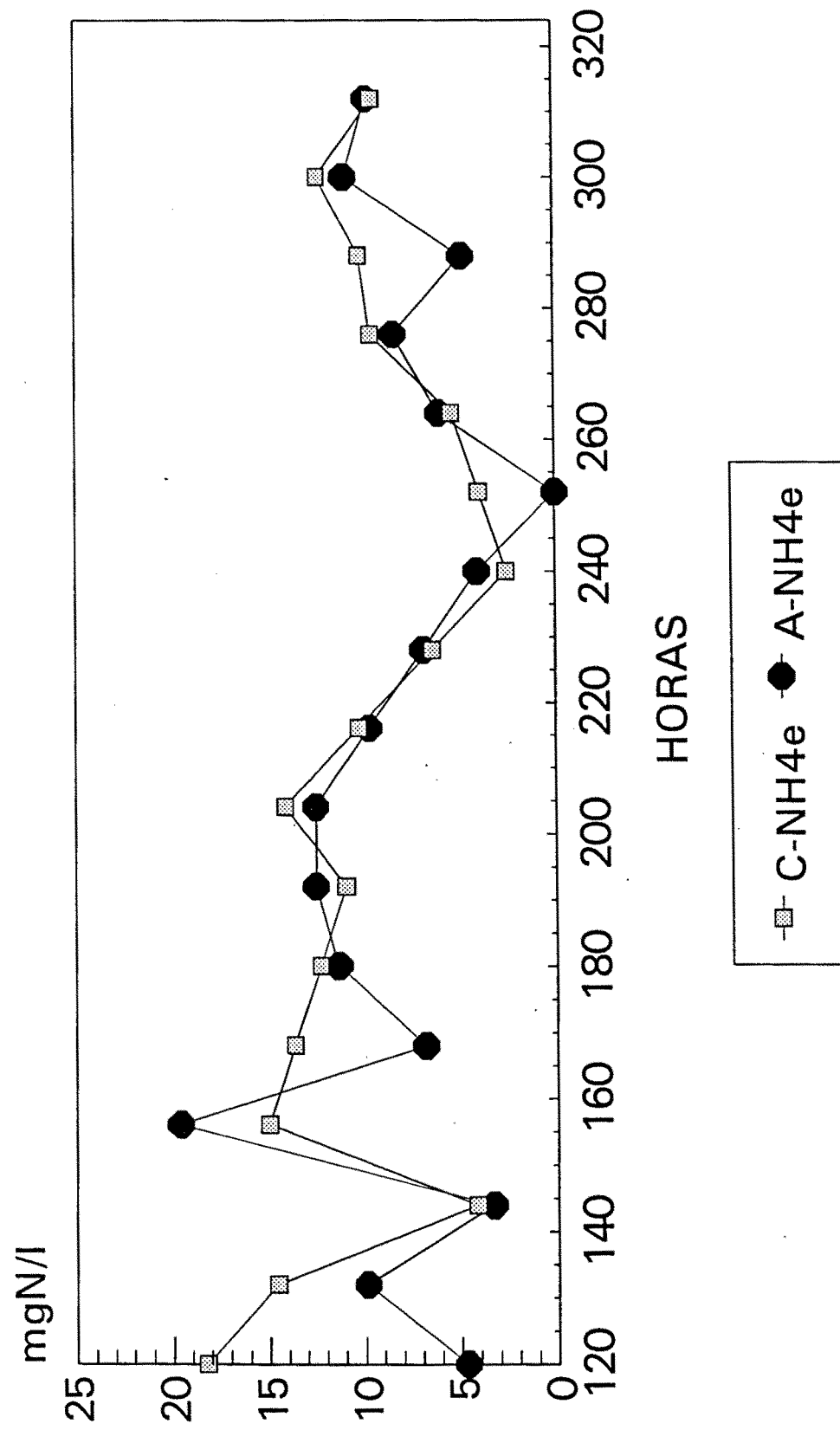
## Experimento 5



Efluente

# DESARROLLO DE LA BIOPELICULA

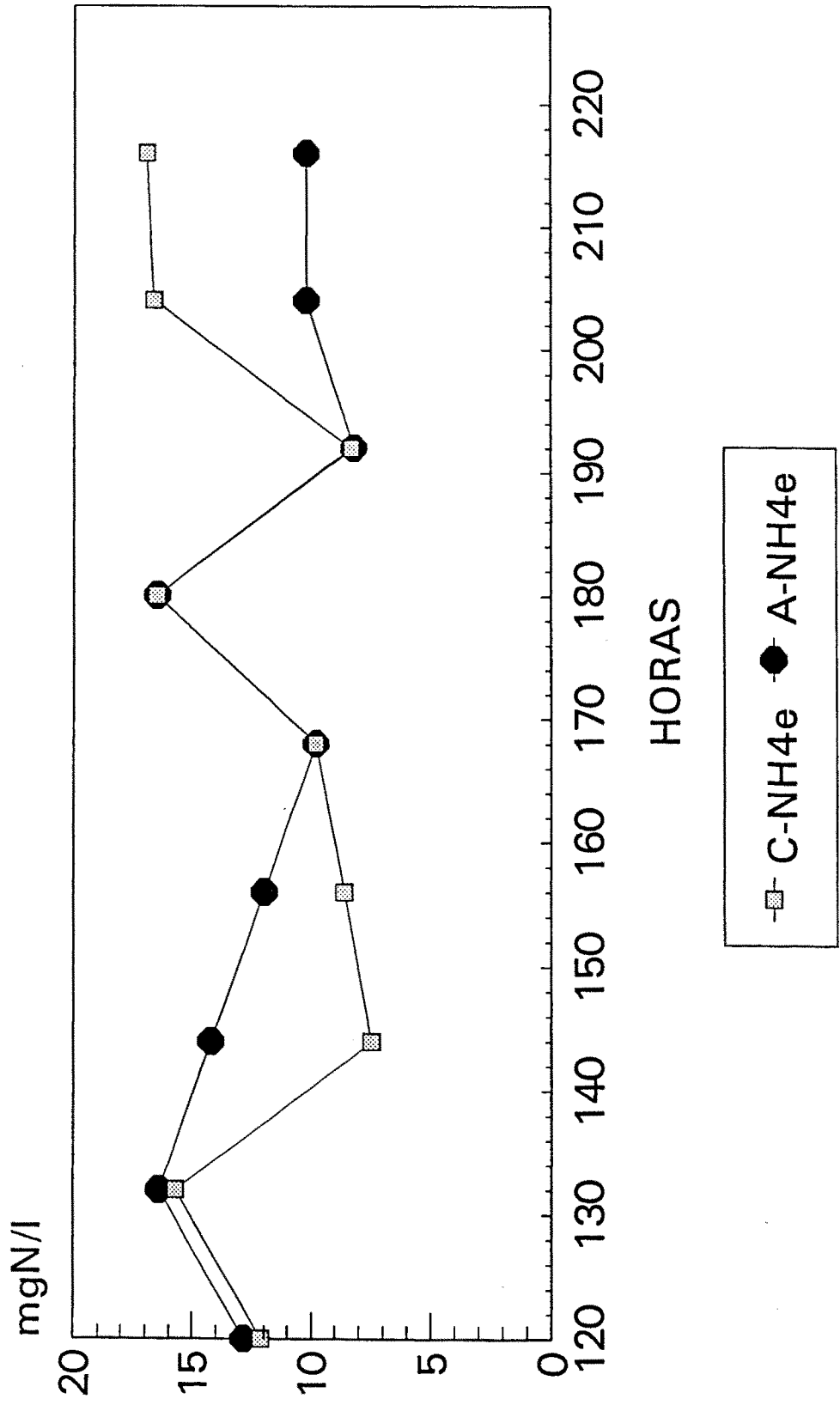
## Experimento 6



Efluente

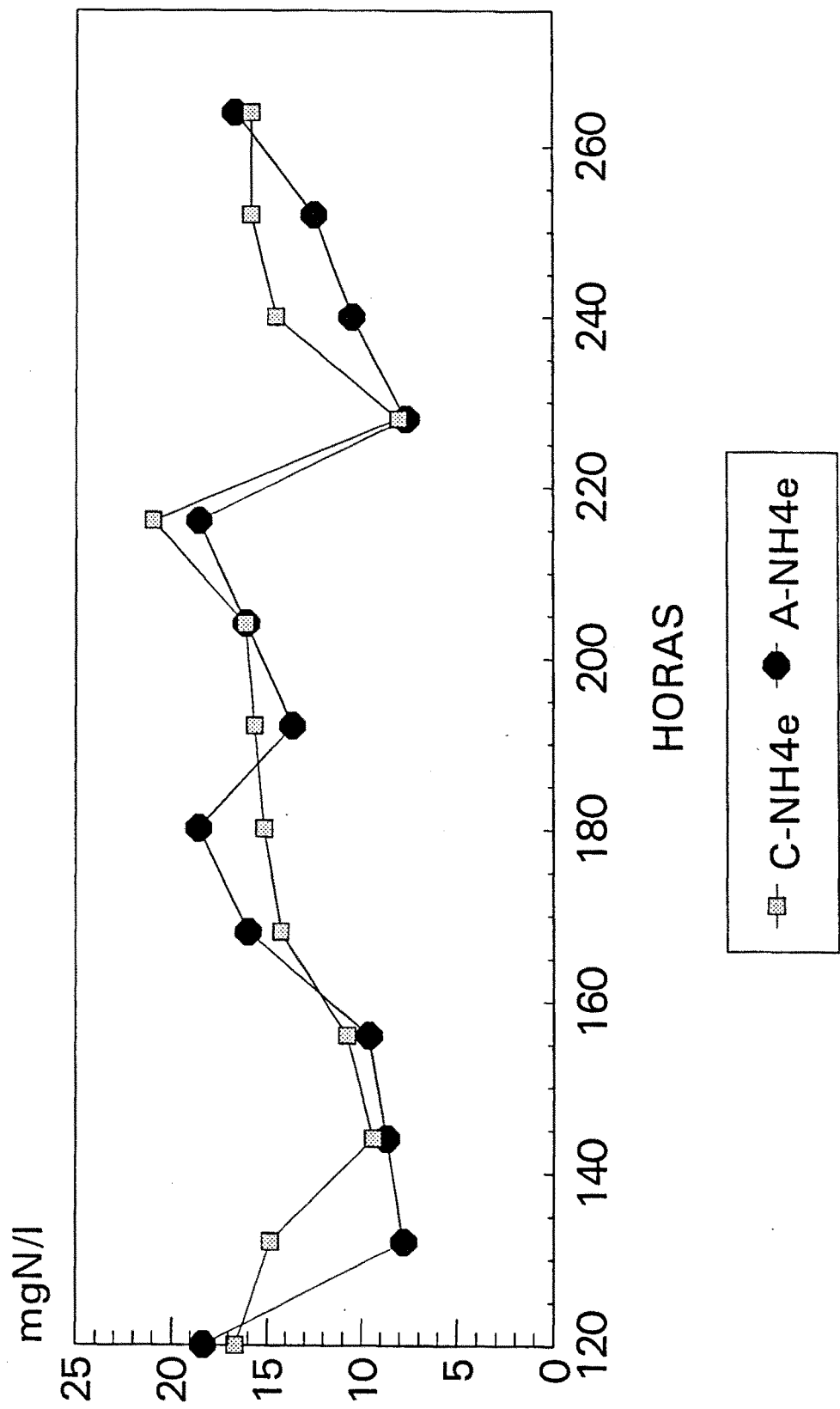
# DESARROLLO DE LA BIOPELICULA

## Experimento 7



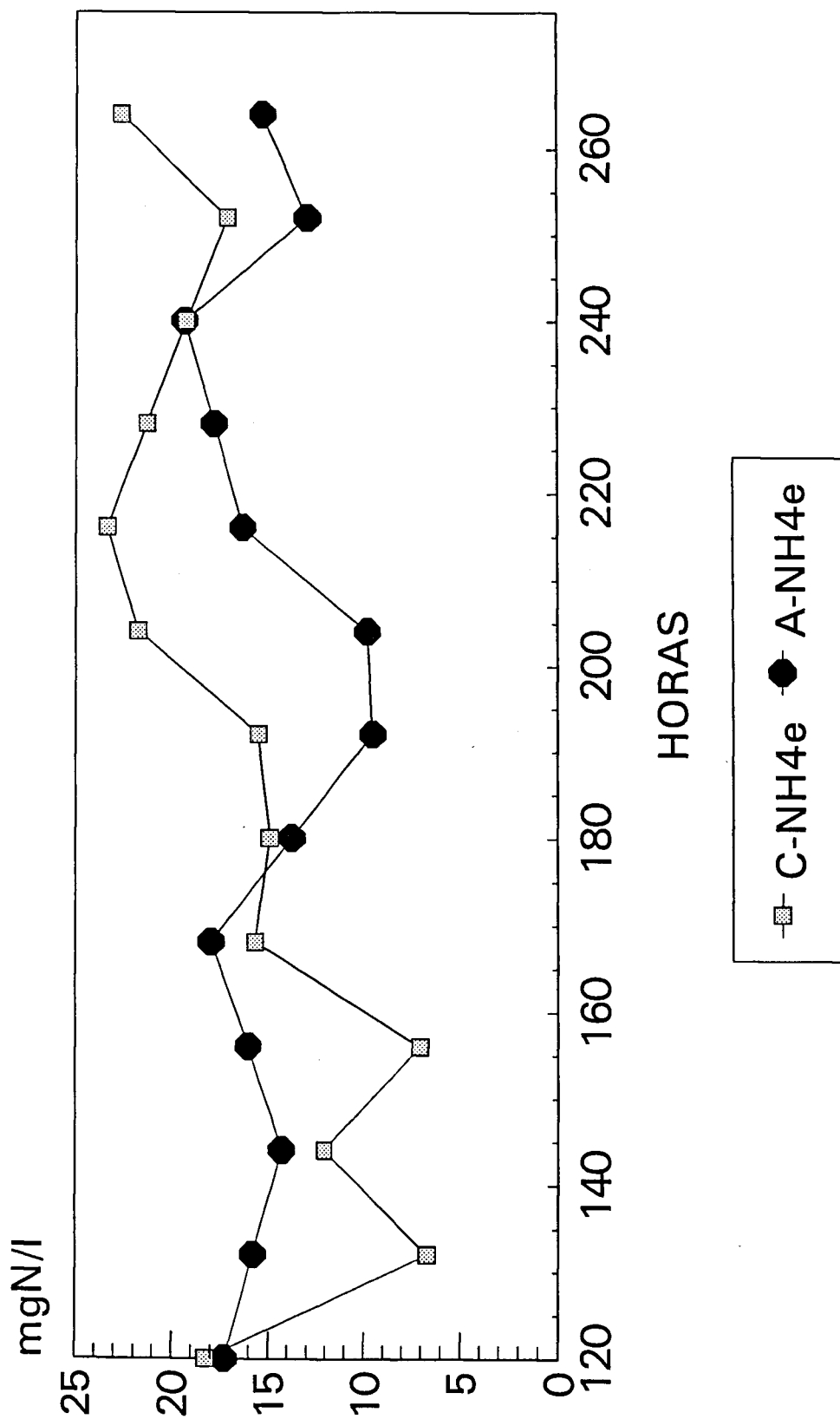
# DESARROLLO DE LA BIOPELICULA

## Experimento 8



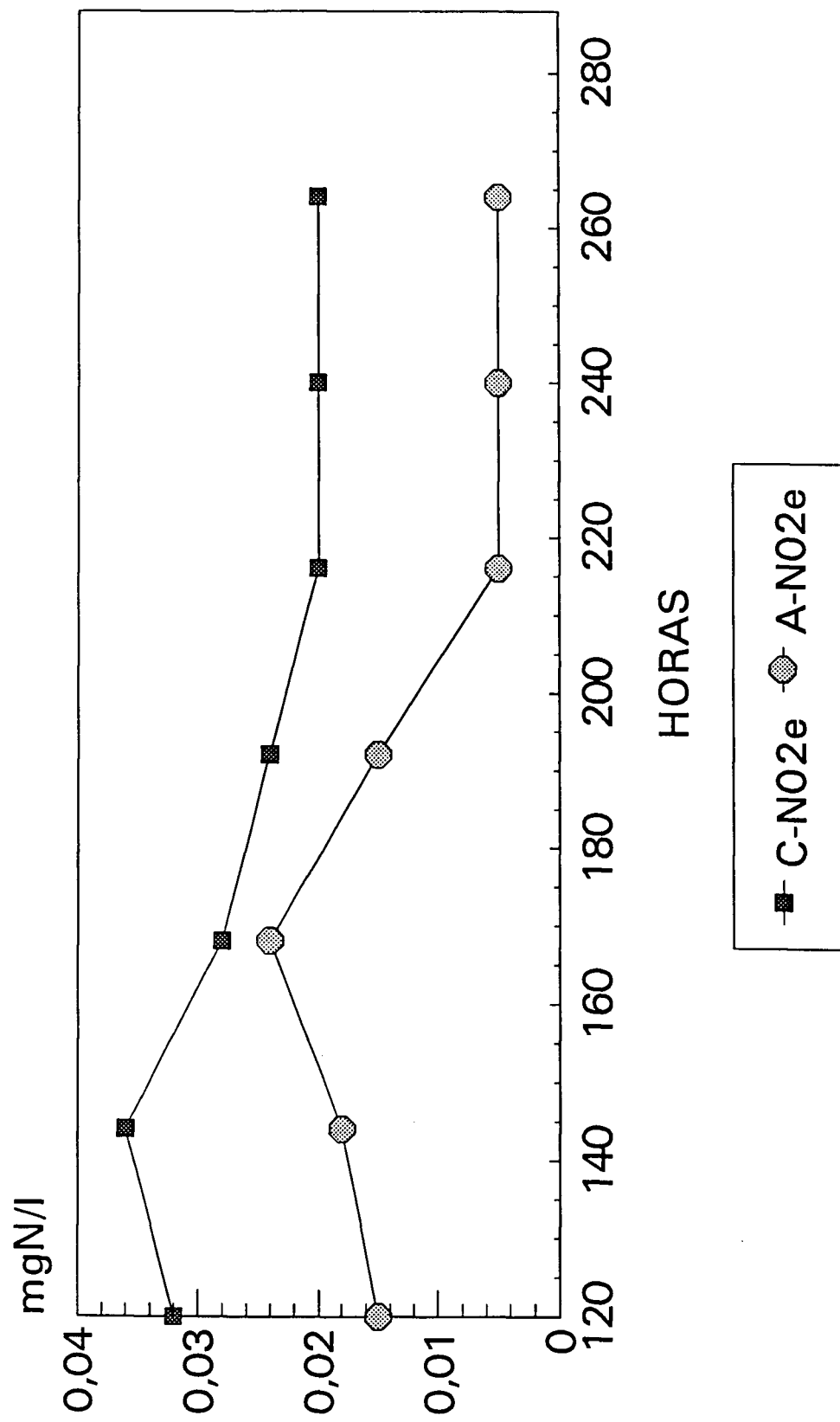
# DESARROLLO DE LA BIOPELICULA

## Experimento 9



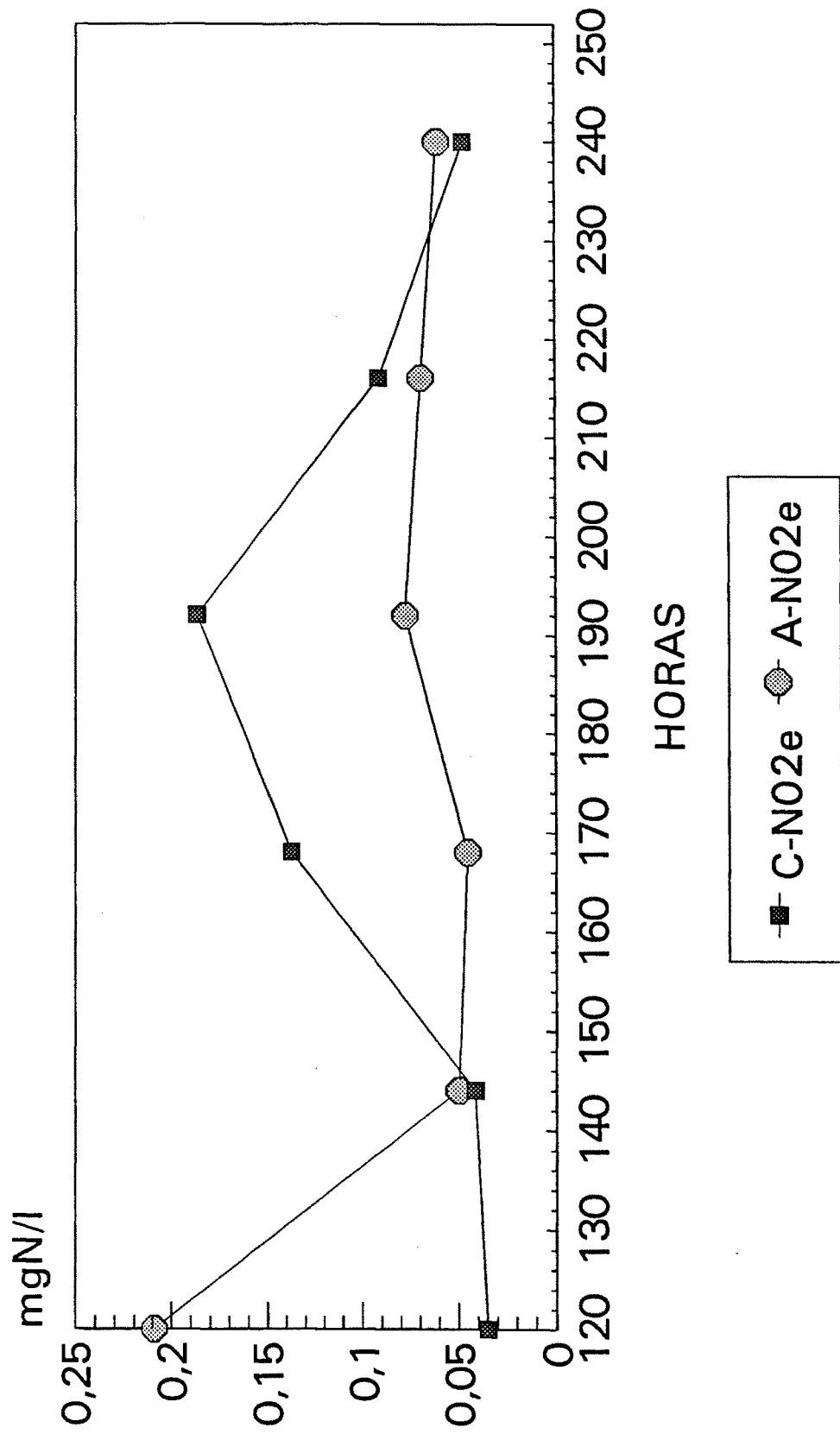
# DESARROLLO DE LA BIOPELICULA

## Experimento 1



# DESARROLLO DE LA BIOPELICULA

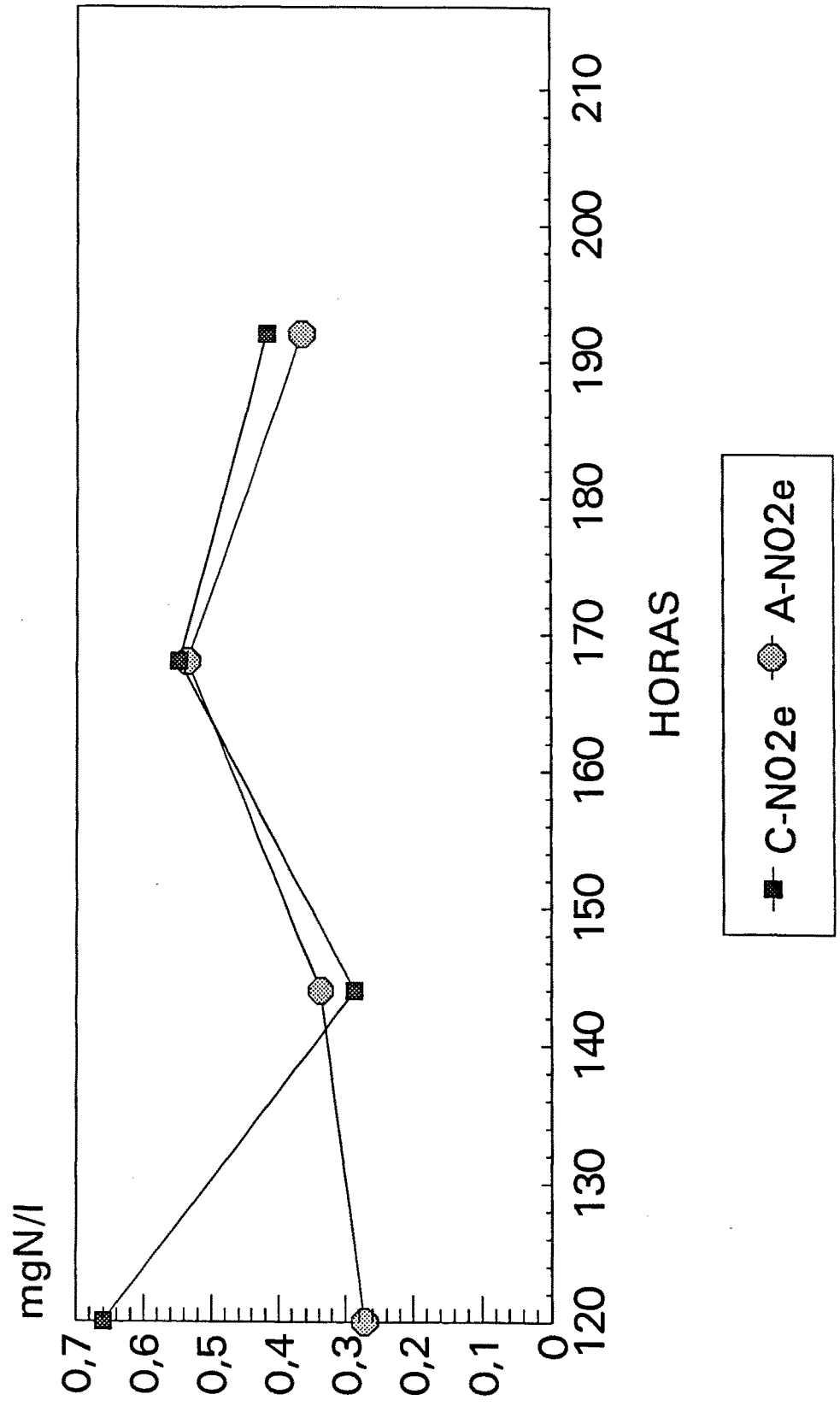
## Experimento 2





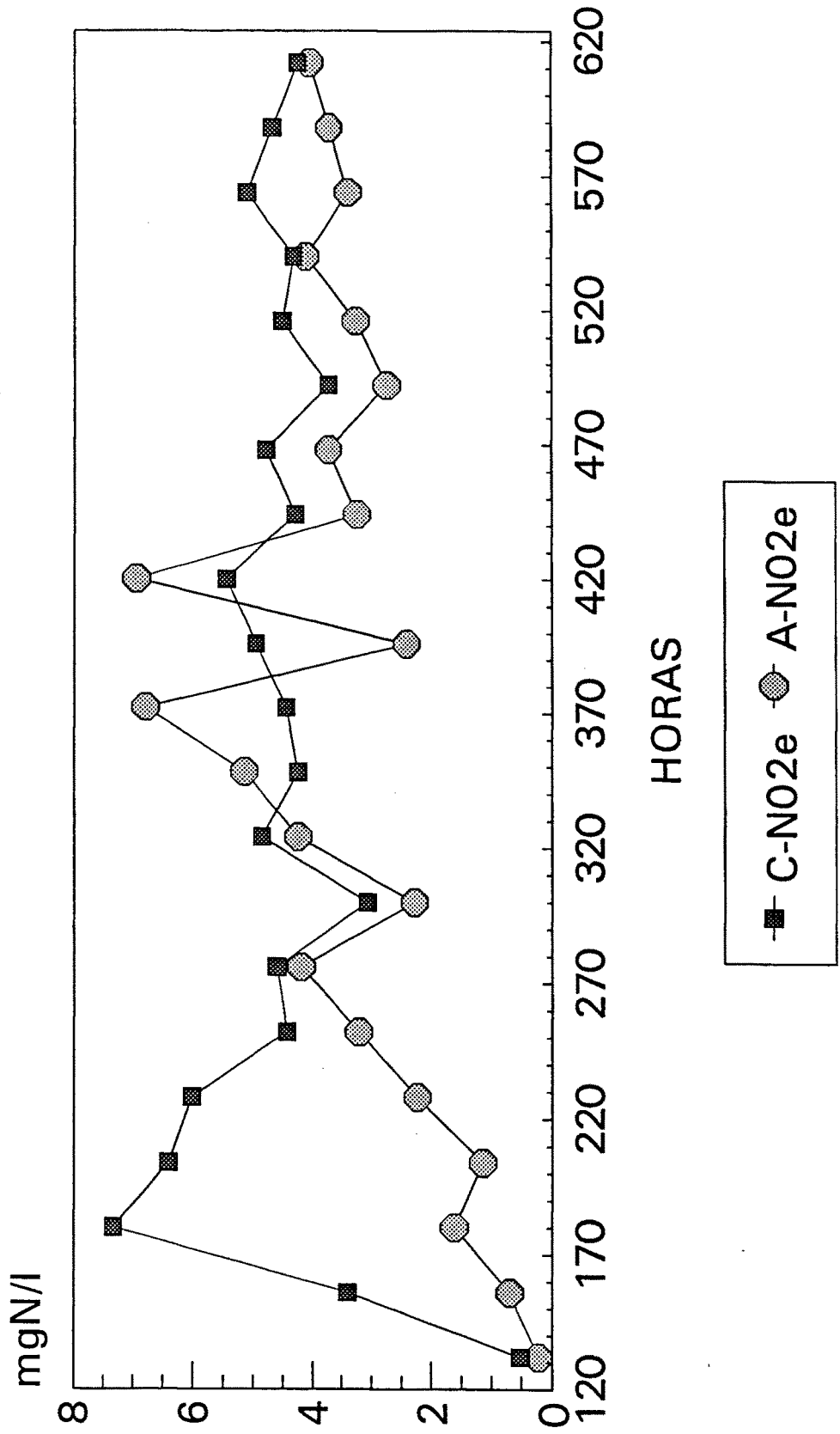
# DESARROLLO DE LA BIOPELICULA

## Experimento 3



# DESARROLLO DE LA BIOPELICULA

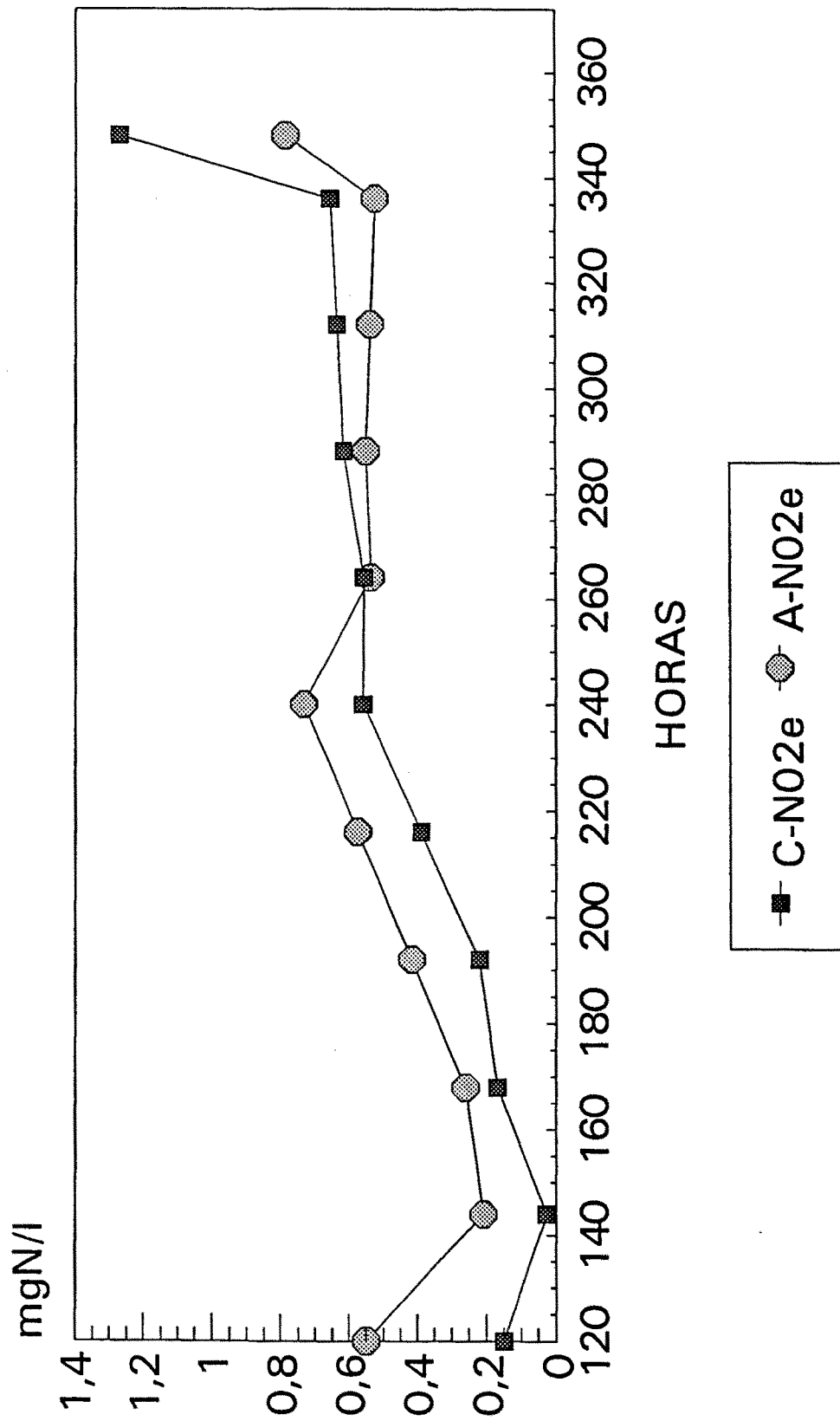
## Experimento 4



Efluente

# DESARROLLO DE LA BIOPELICULA

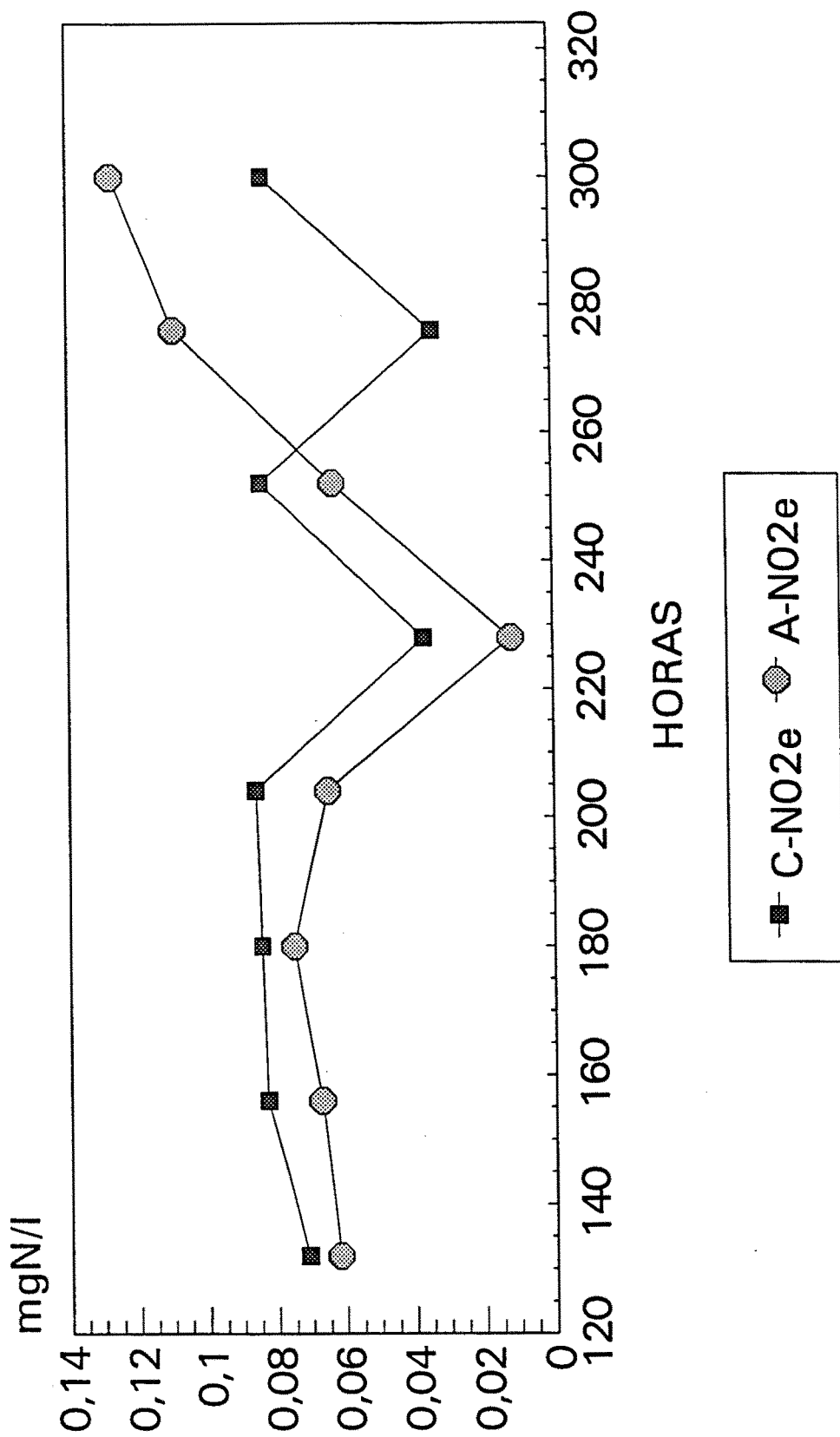
## Experimento 5



Efluente

# DESARROLLO DE LA BIOPELICULA

## Experimento 6

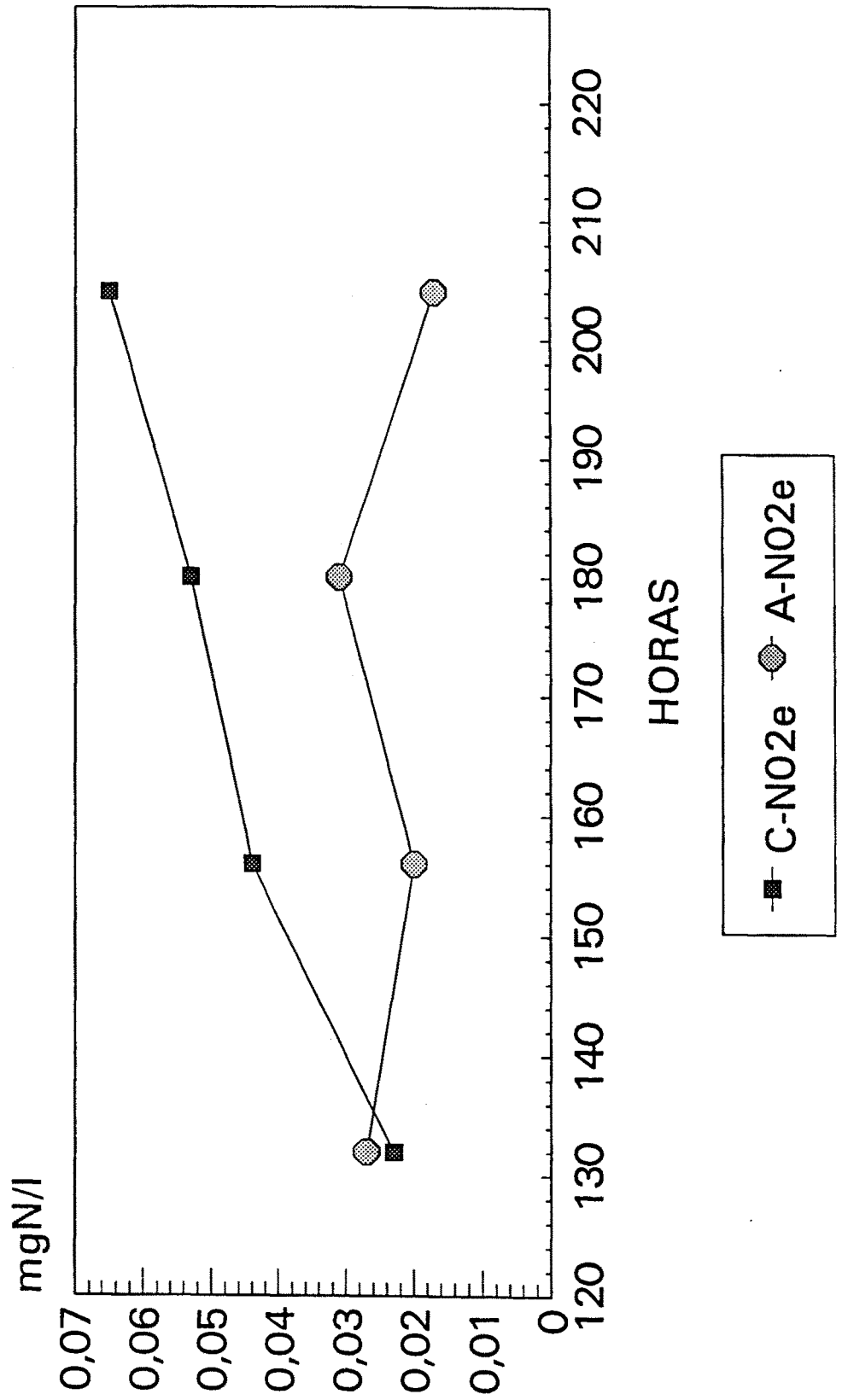


A2-60

Efluente

# DESARROLLO DE LA BIOPELICULA

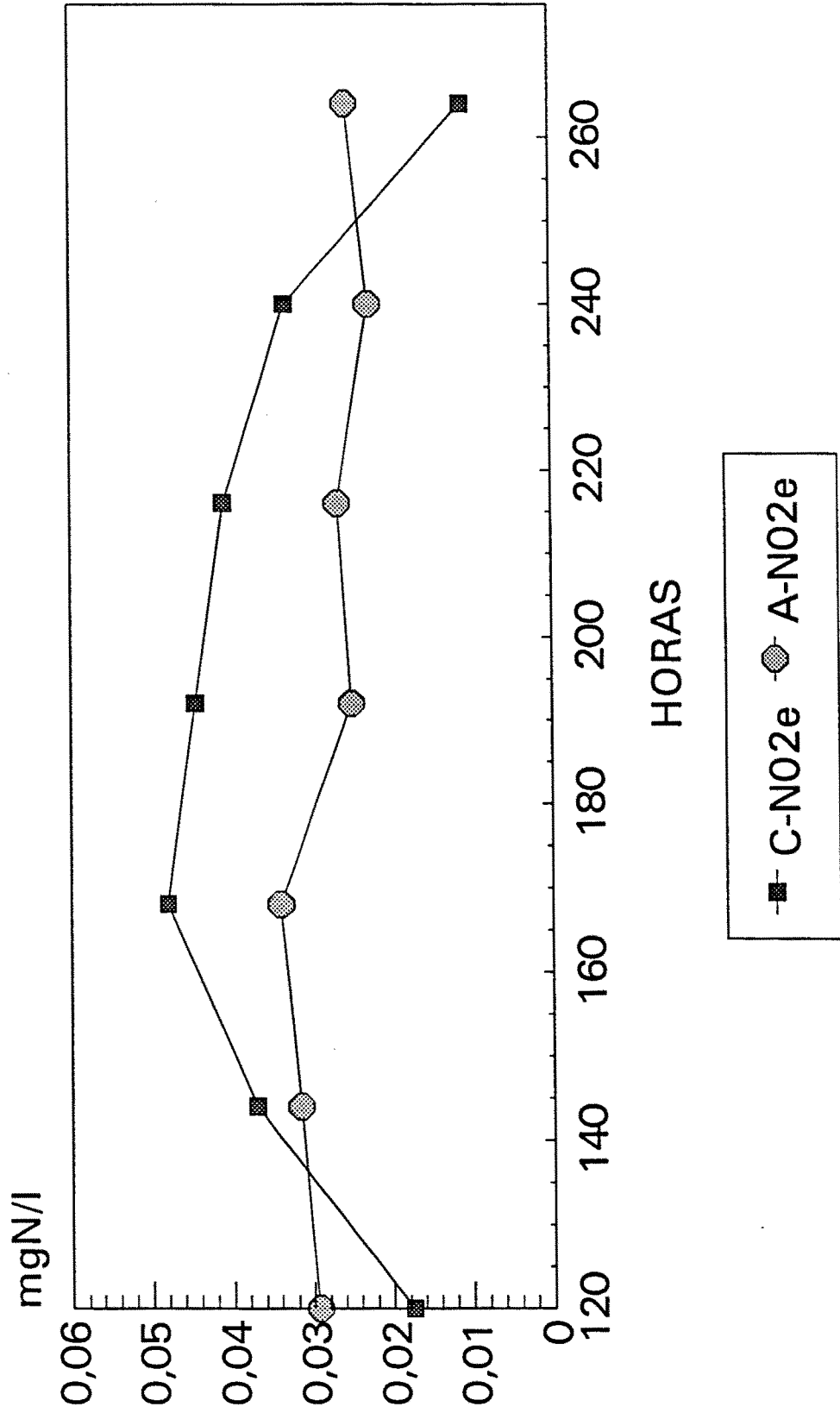
## Experimento 7



Efluente

# DESARROLLO DE LA BIOPELICULA

## Experimento 8

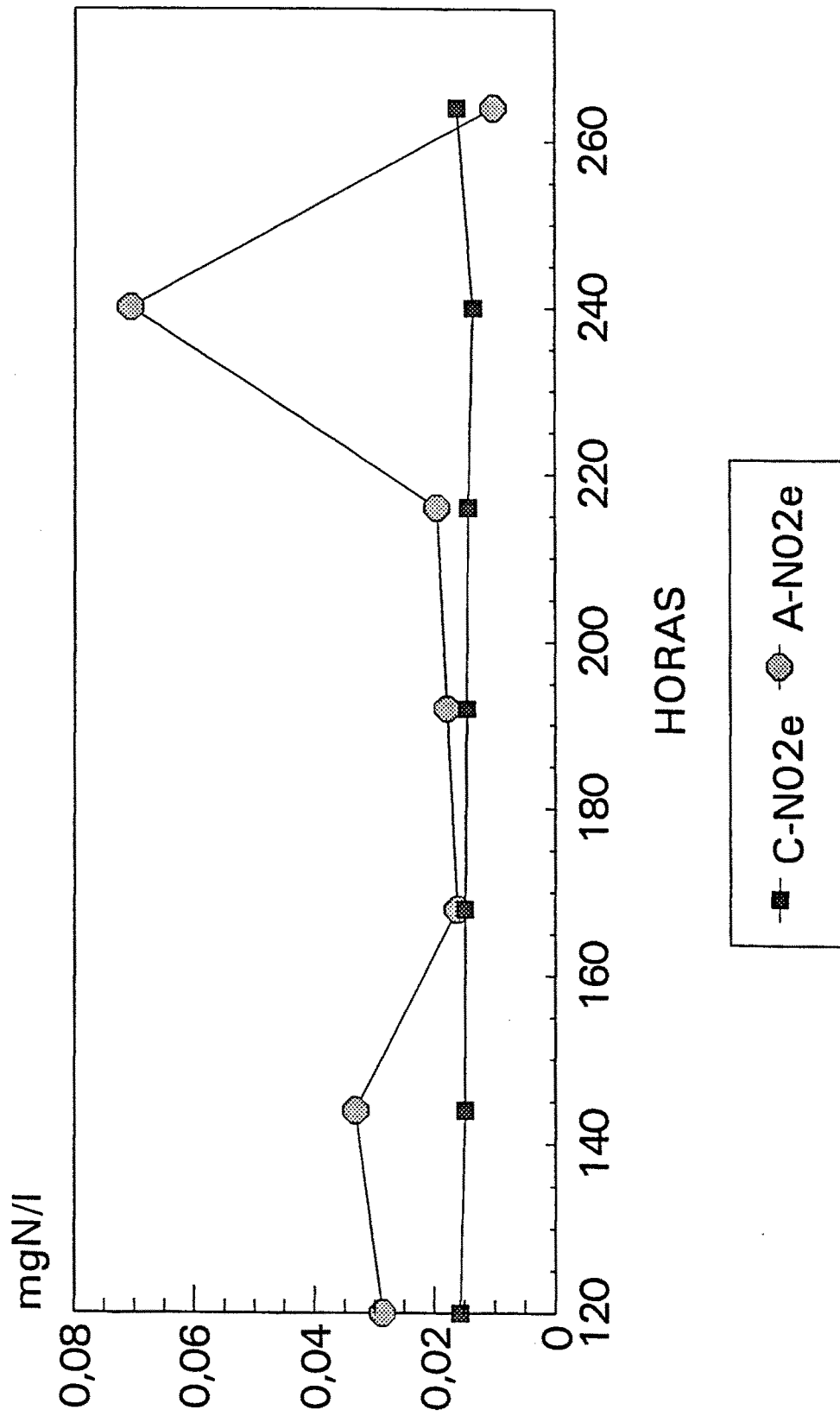


A2-62

Efluente

# DESARROLLO DE LA BIOPELICULA

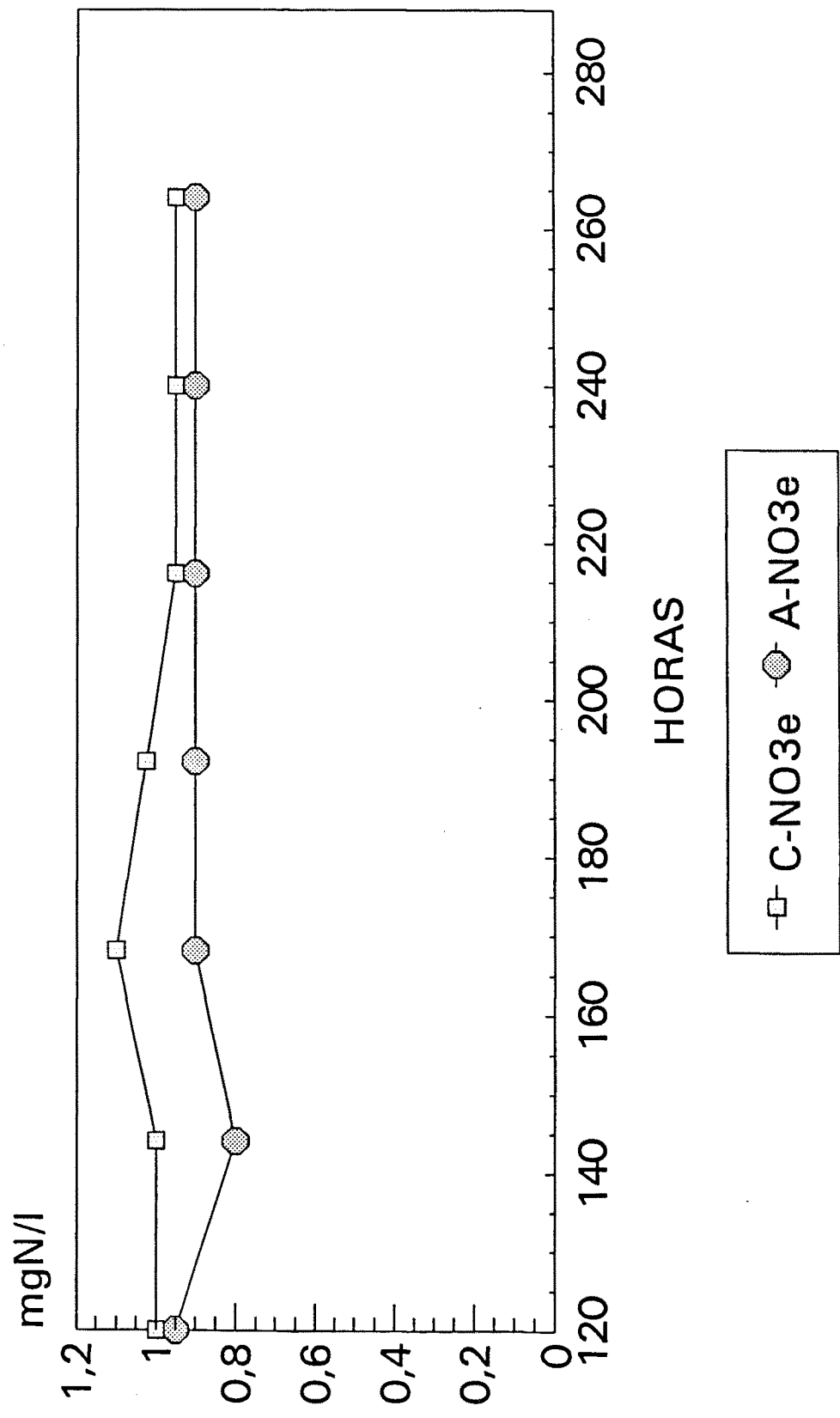
## Experimento 9



Efluente

# DESARROLLO DE LA BIOPELICULA

## Experimento 1

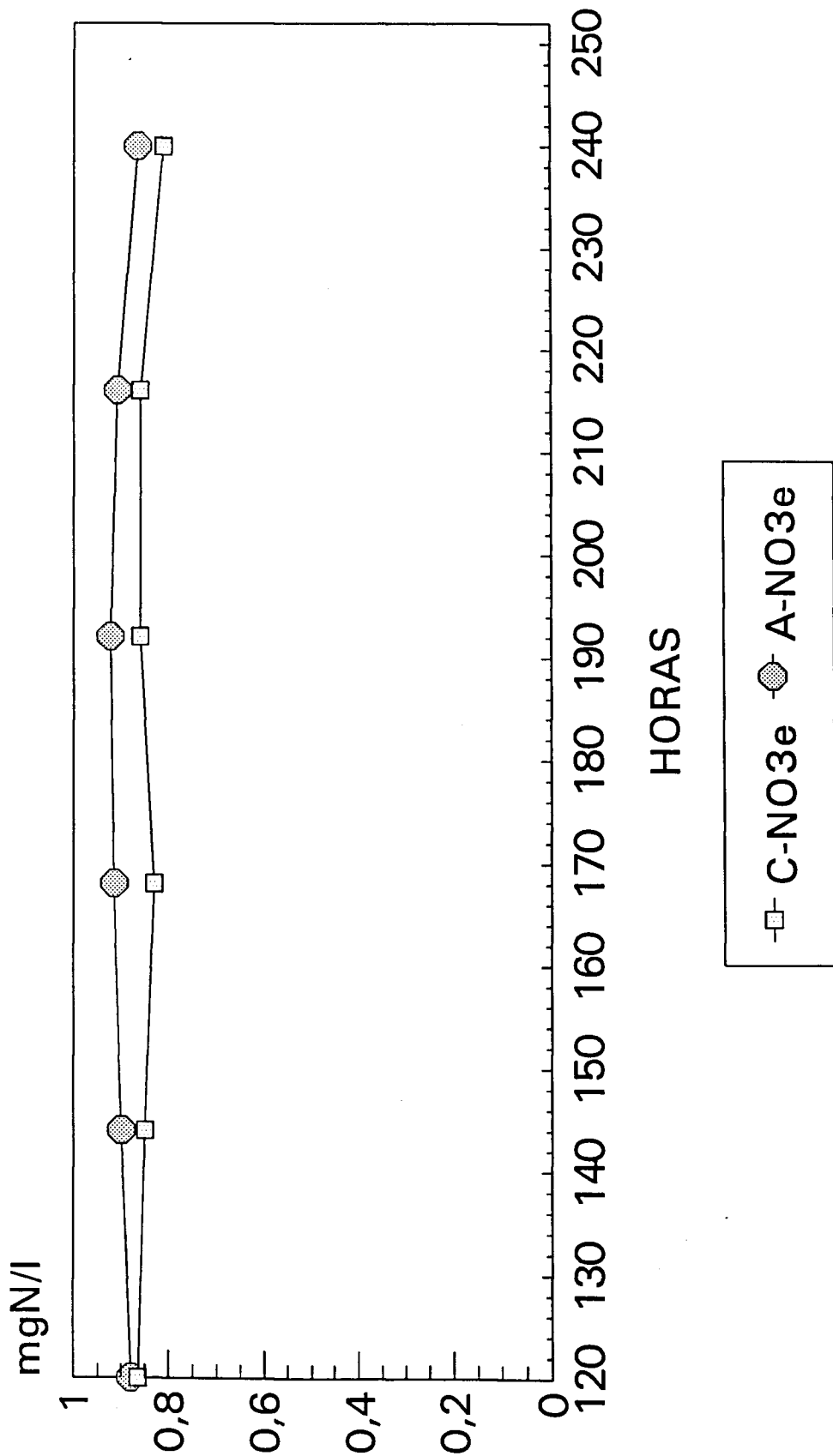


Efluente



# DESARROLLO DE LA BIOPELICULA

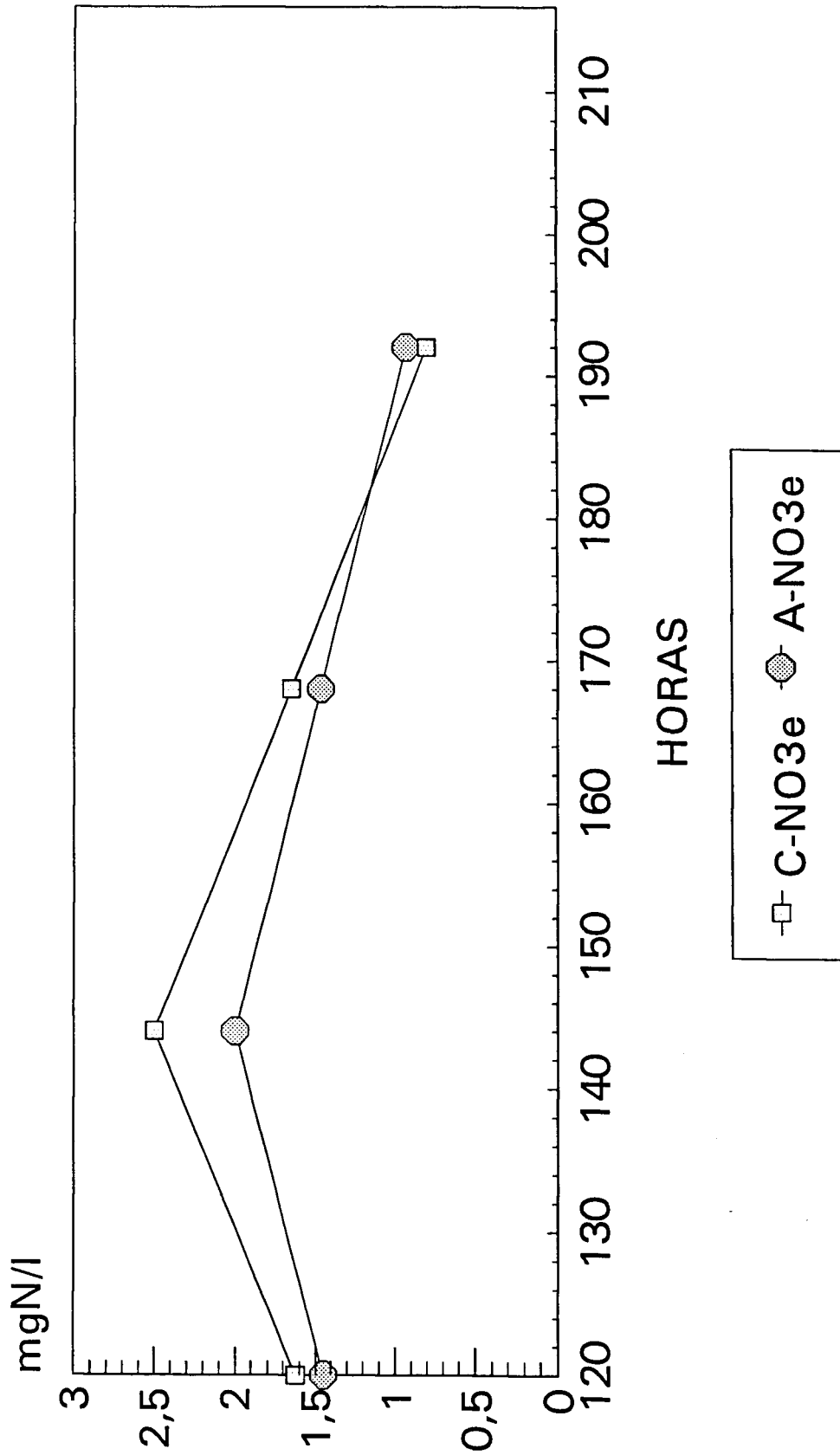
## Experimento 2



Efluente

# DESARROLLO DE LA BIOPELICULA

## Experimento 3

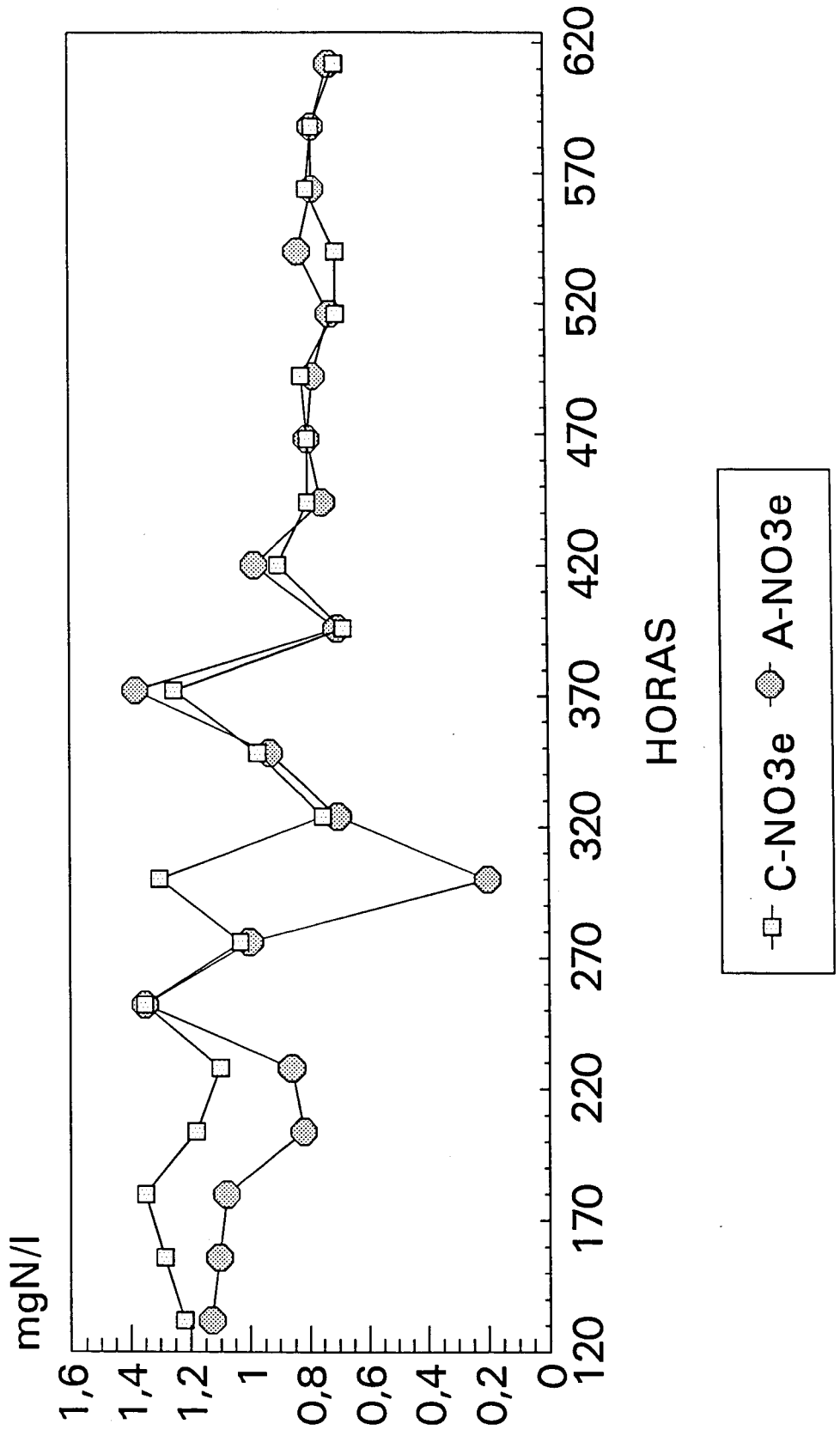


A2-66

Efluente

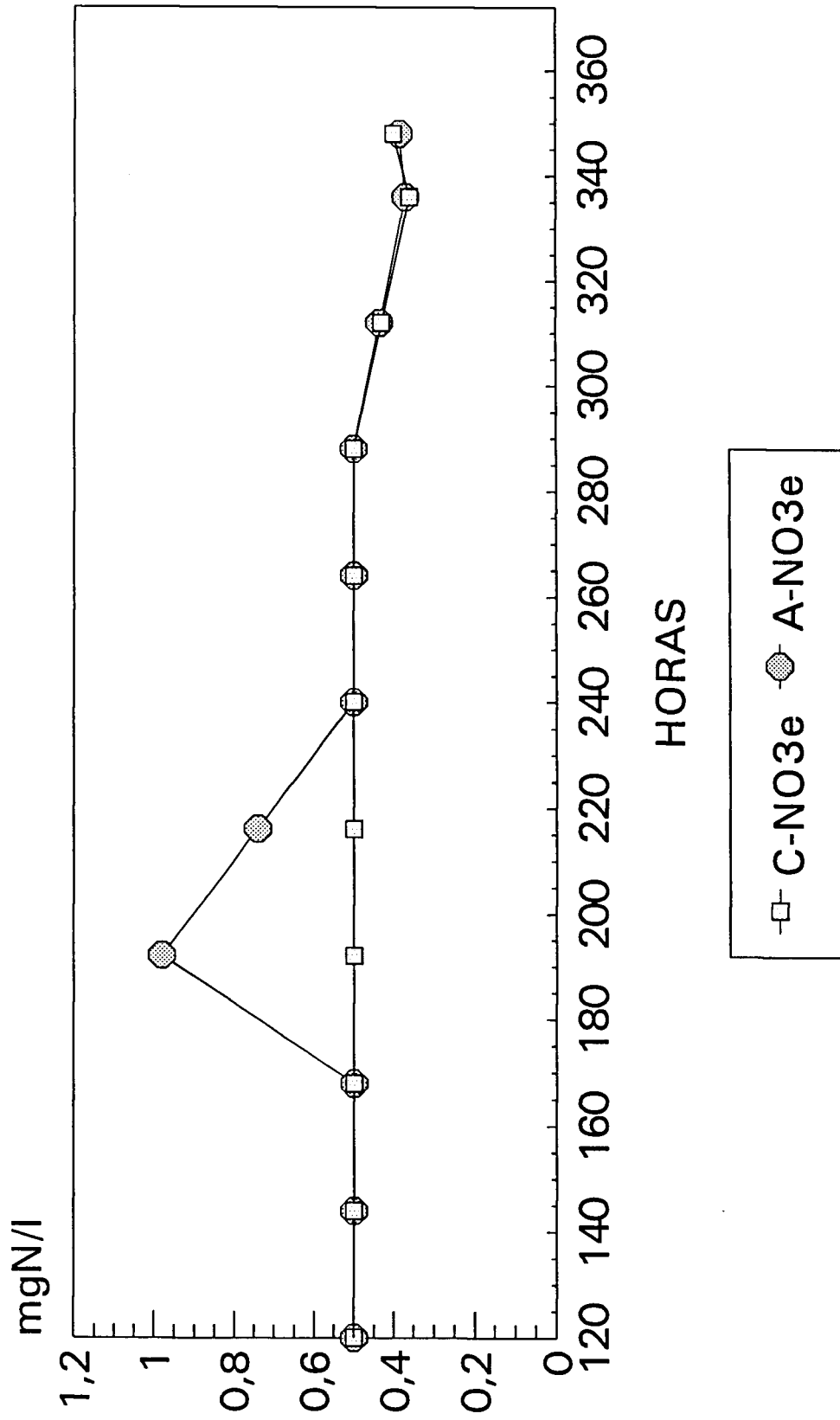
# DESARROLLO DE LA BIOPELICULA

## Experimento 4



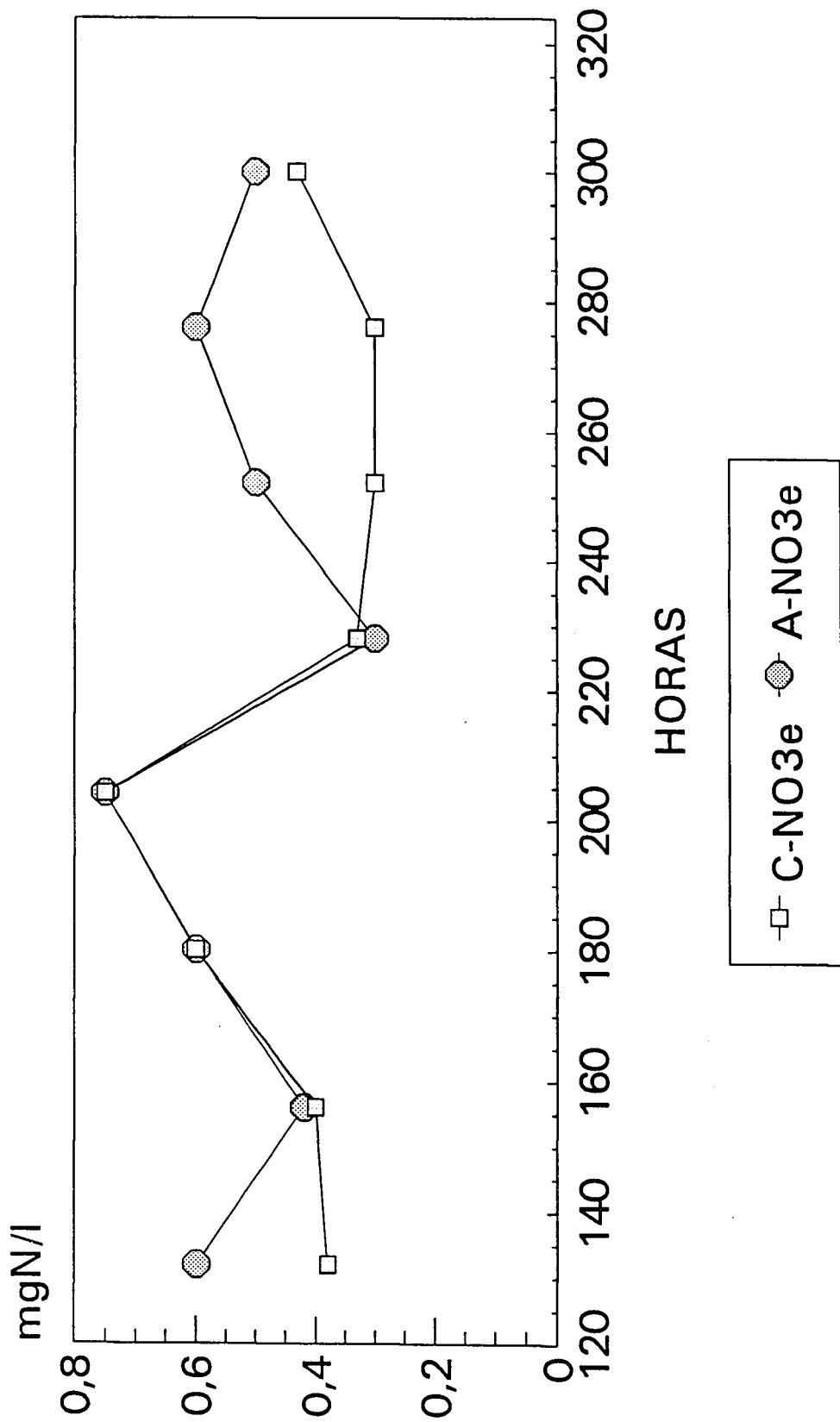
# DESARROLLO DE LA BIOPELICULA

## Experimento 5



# DESARROLLO DE LA BIOPELICULA

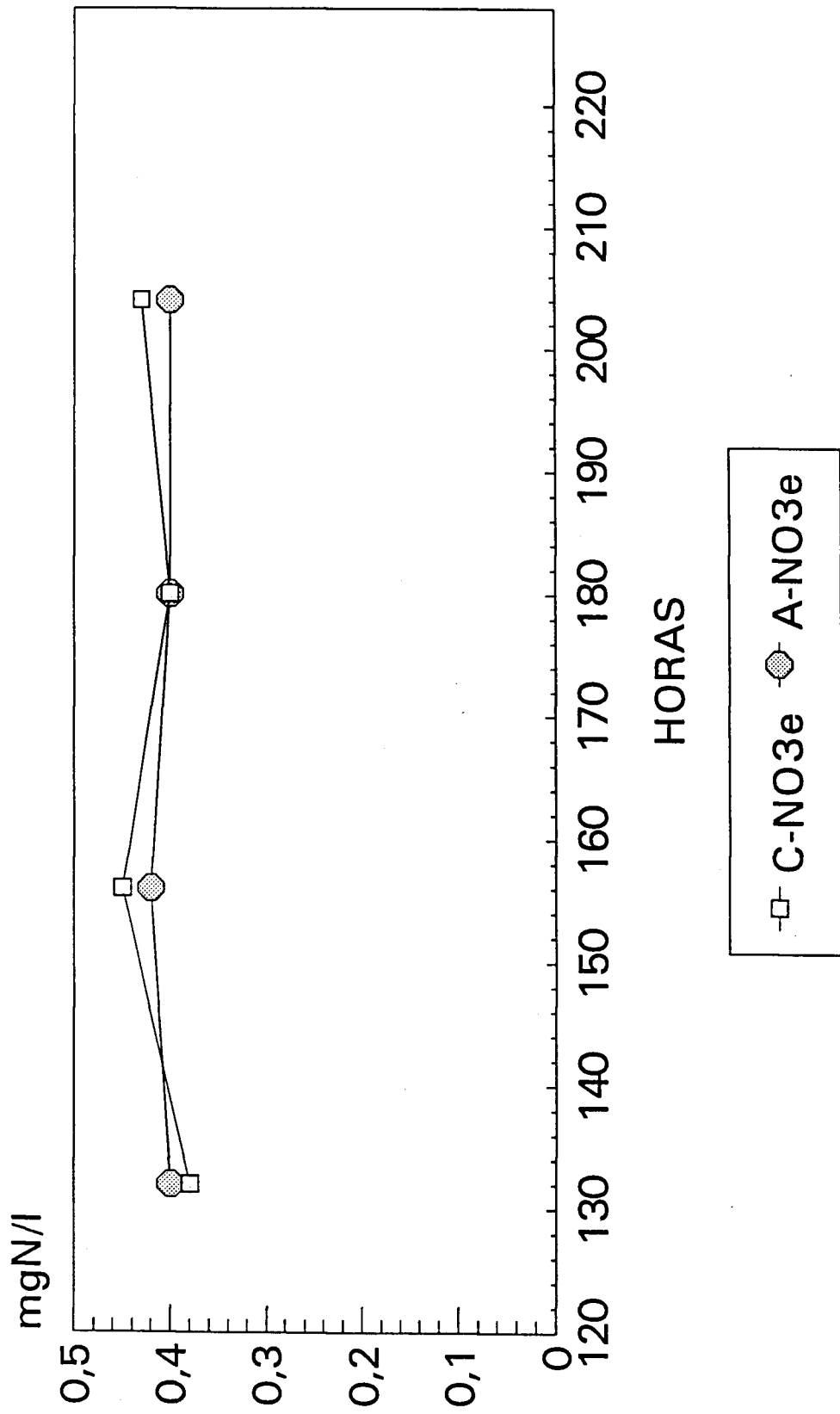
## Experimento 6



Efluente

# DESARROLLO DE LA BIOPELICULA

## Experimento 7

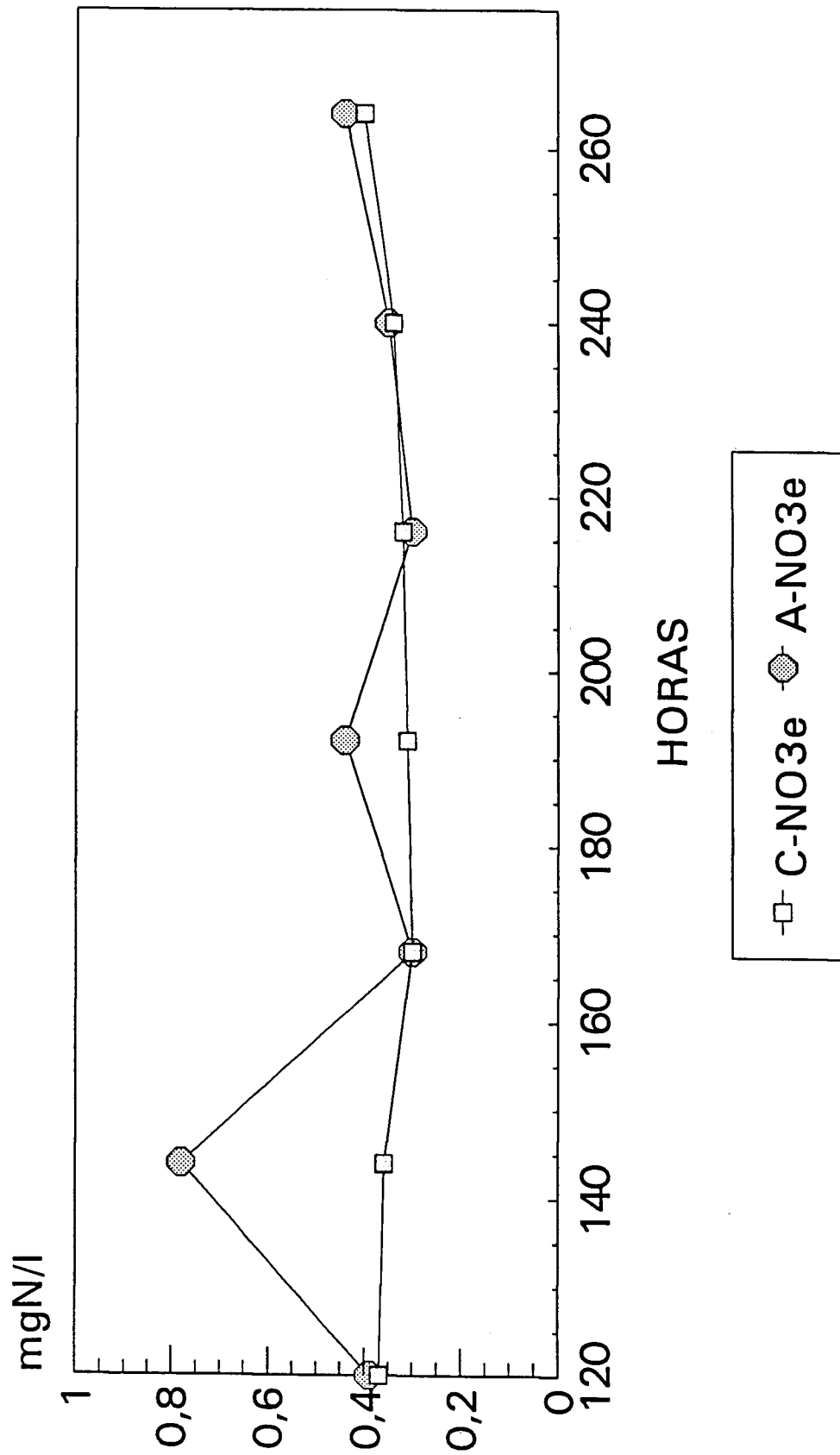


A2-70

Efluente

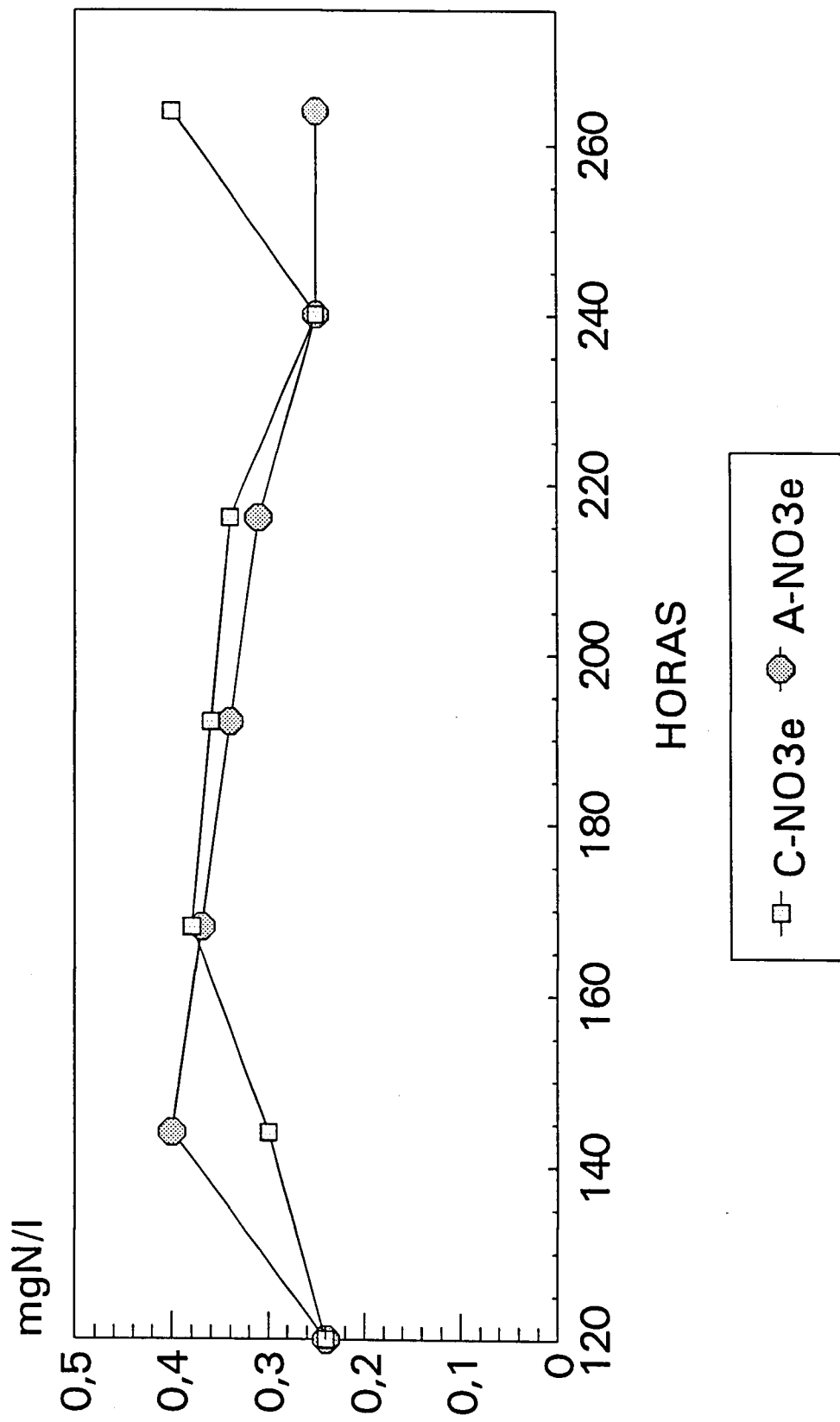
# DESARROLLO DE LA BIOPELICULA

## Experimento 8



# DESARROLLO DE LA BIOPELICULA

## Experimento 9



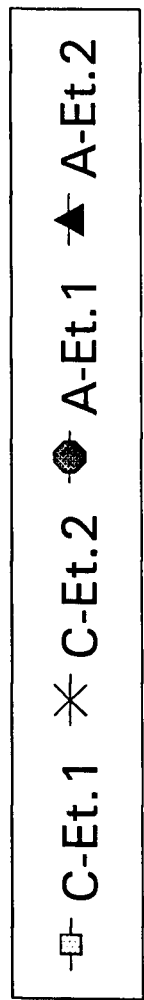
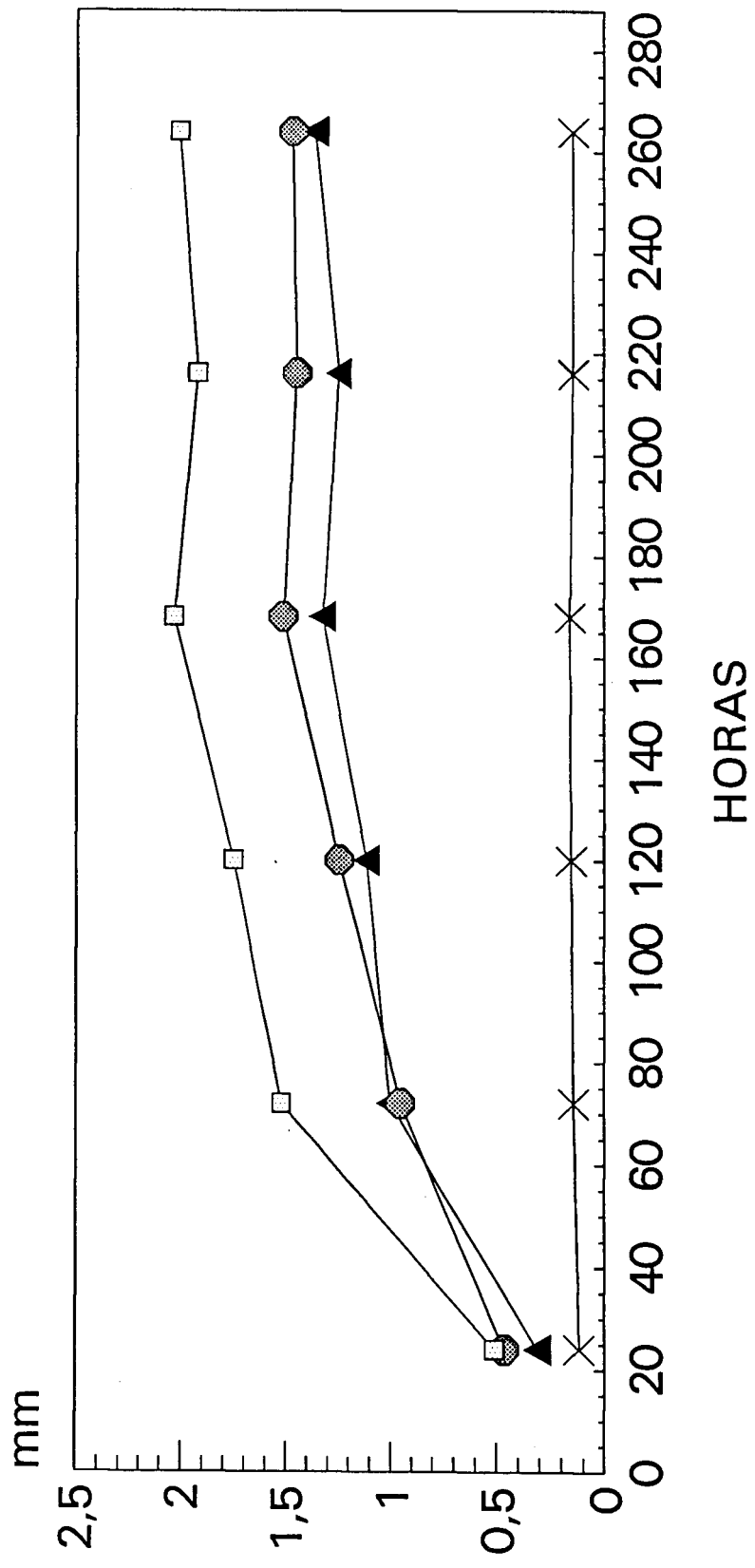
A2-72

Efluente



# DESARROLLO DE LA BIOPELICULA

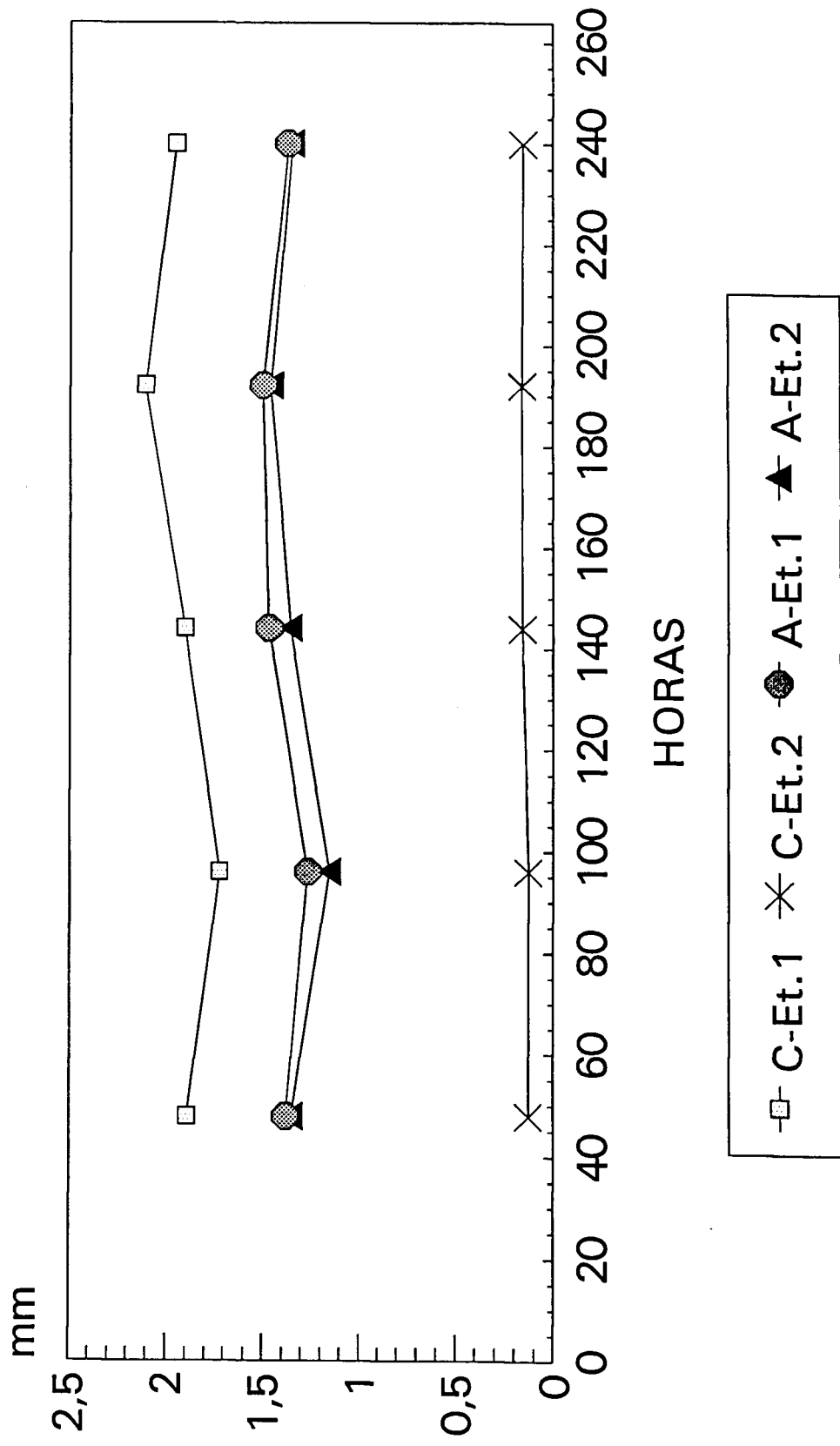
## Experimento 1



Espesores

# DESARROLLO DE LA BIOPELICULA

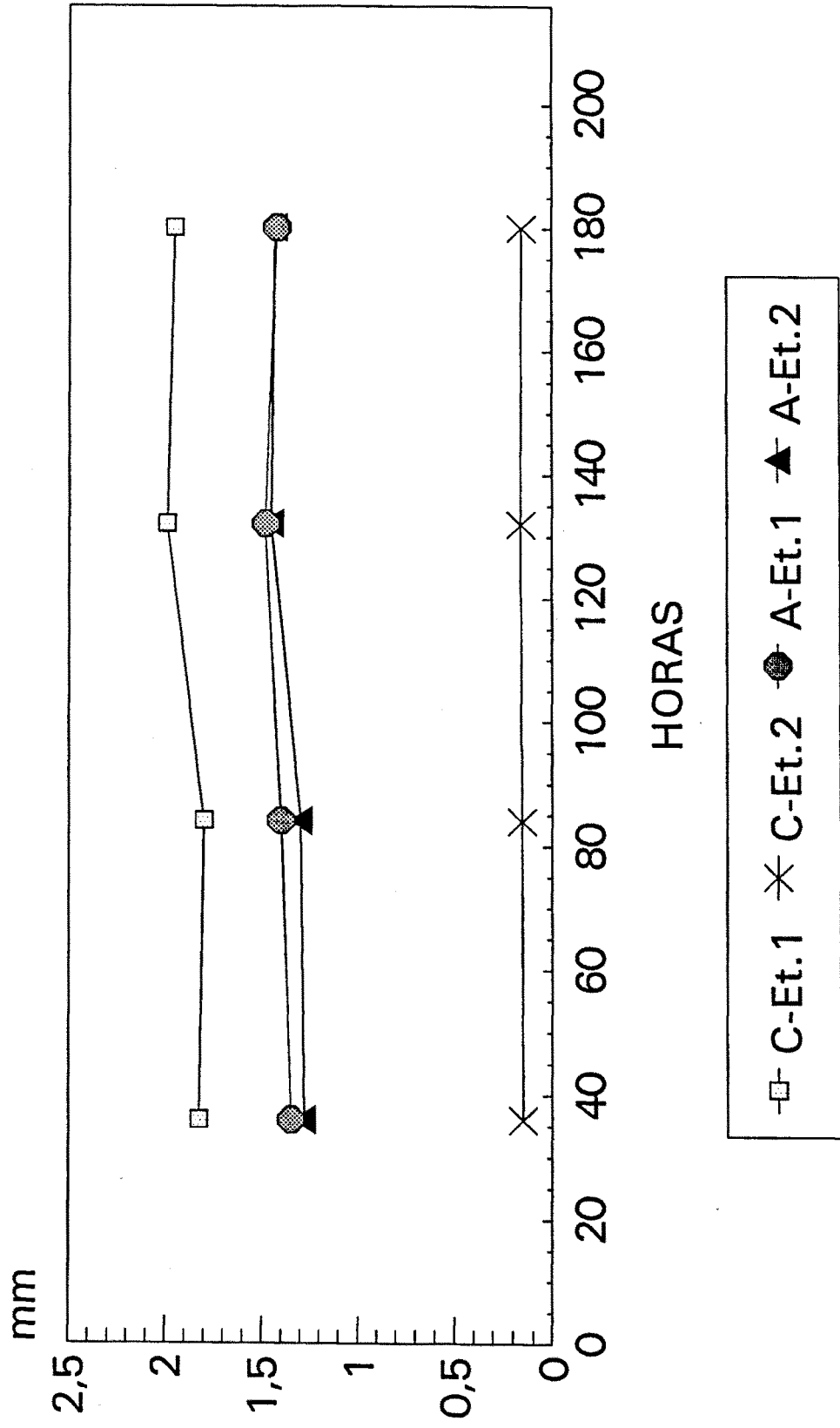
## Experimento 2



Espesores

# DESARROLLO DE LA BIOPELICULA

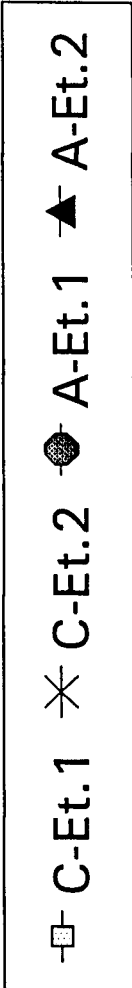
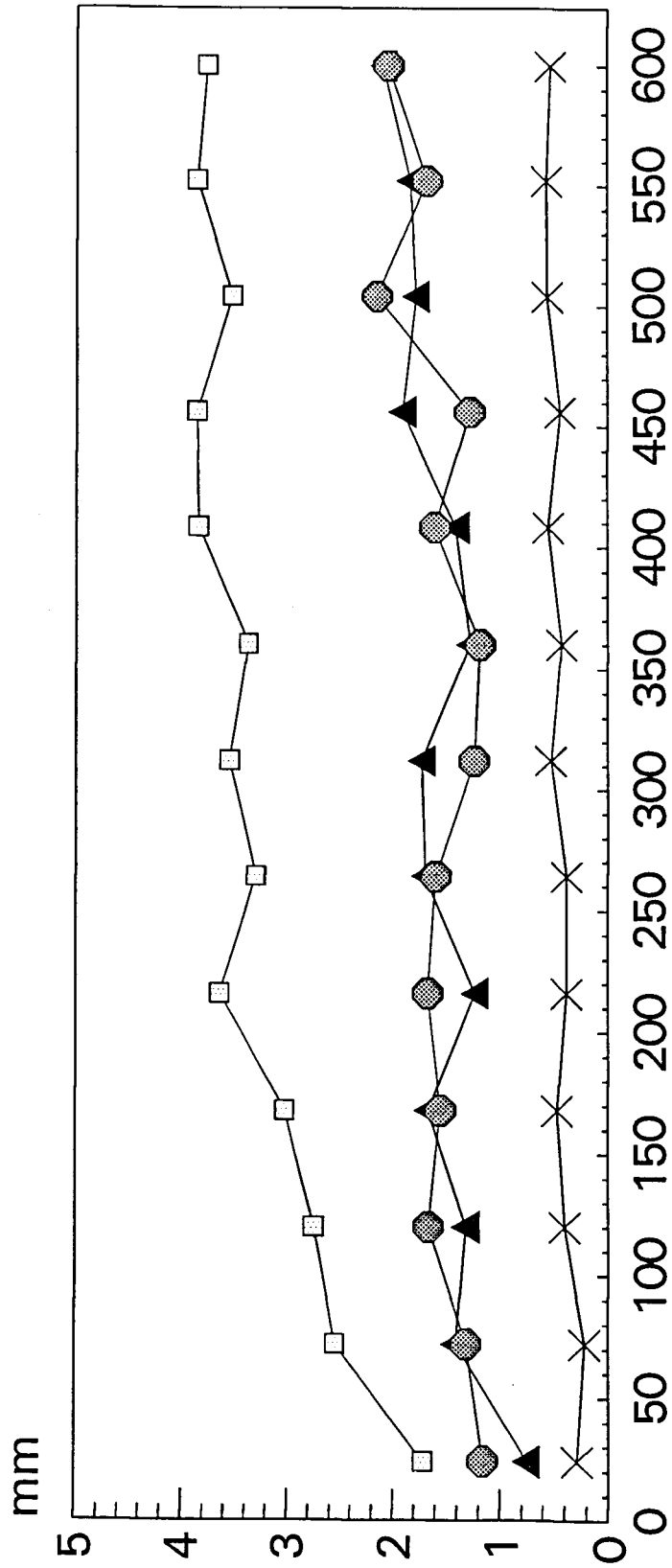
## Experimento 3



Espesores

# DESARROLLO DE LA BIOPELICULA

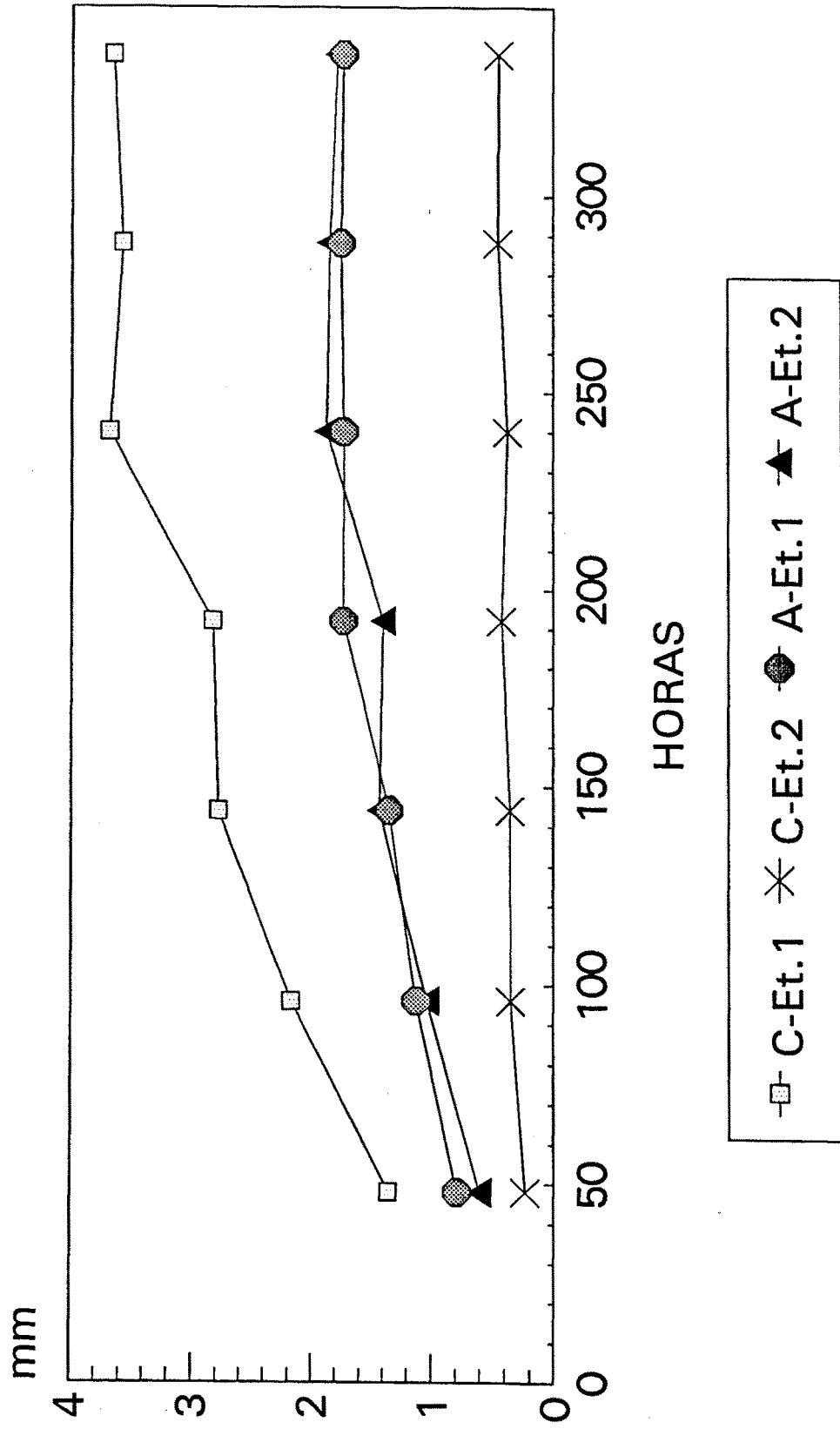
## Experimento 4



Espesores

# DESARROLLO DE LA BIOPELICULA

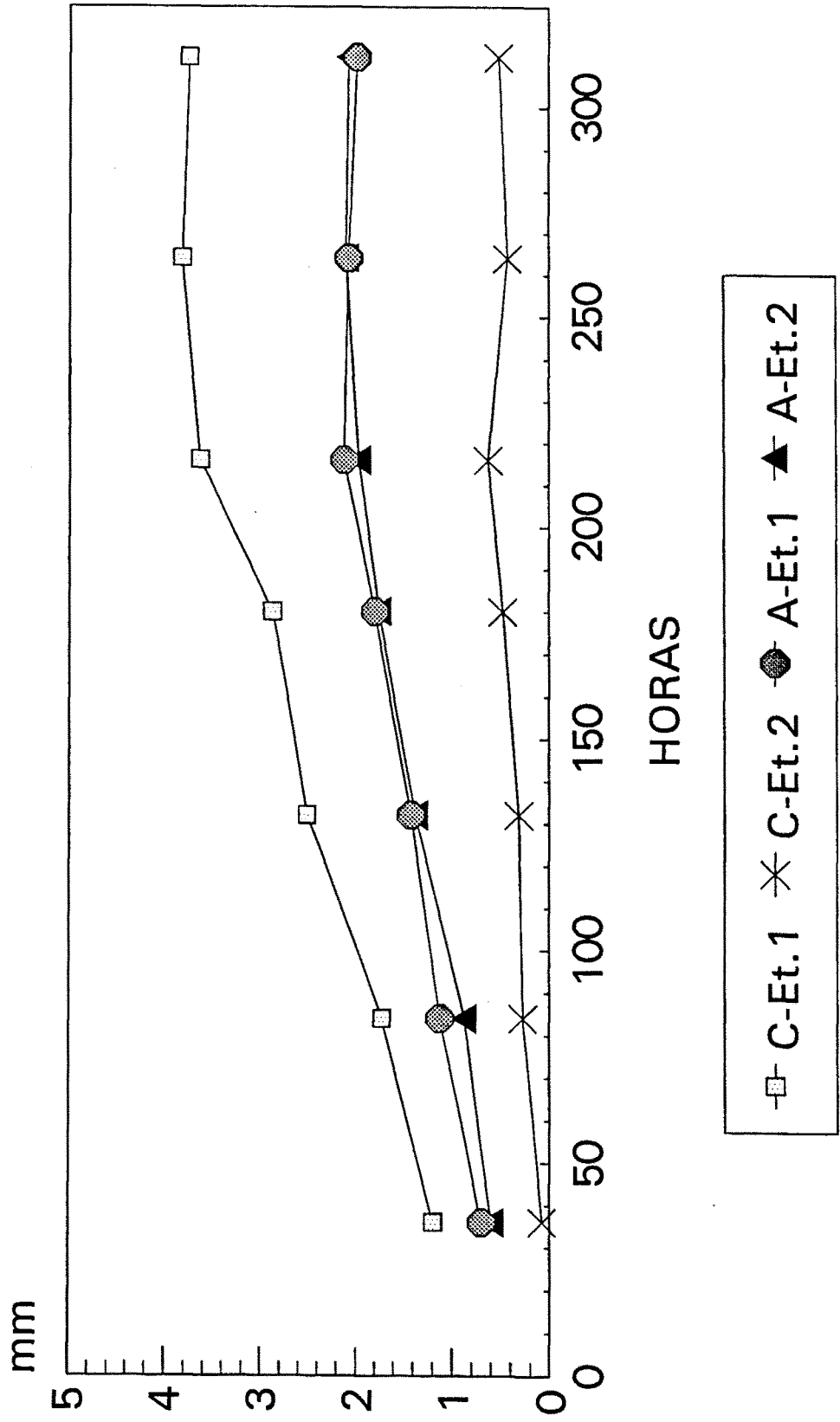
## Experimento 5



Espesores

# DESARROLLO DE LA BIOPELICULA

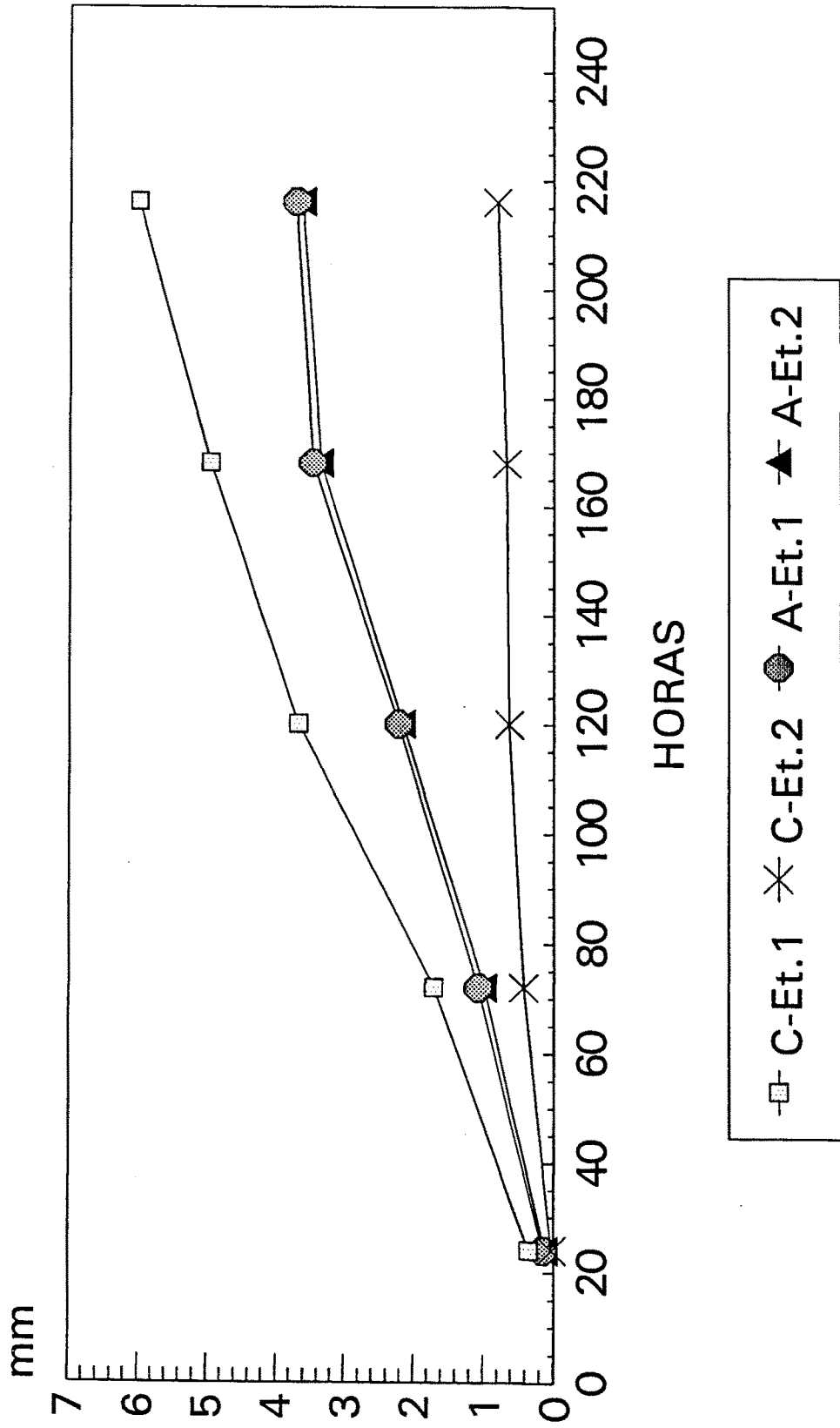
## Experimento 6



Espesores

# DESARROLLO DE LA BIOPELICULA

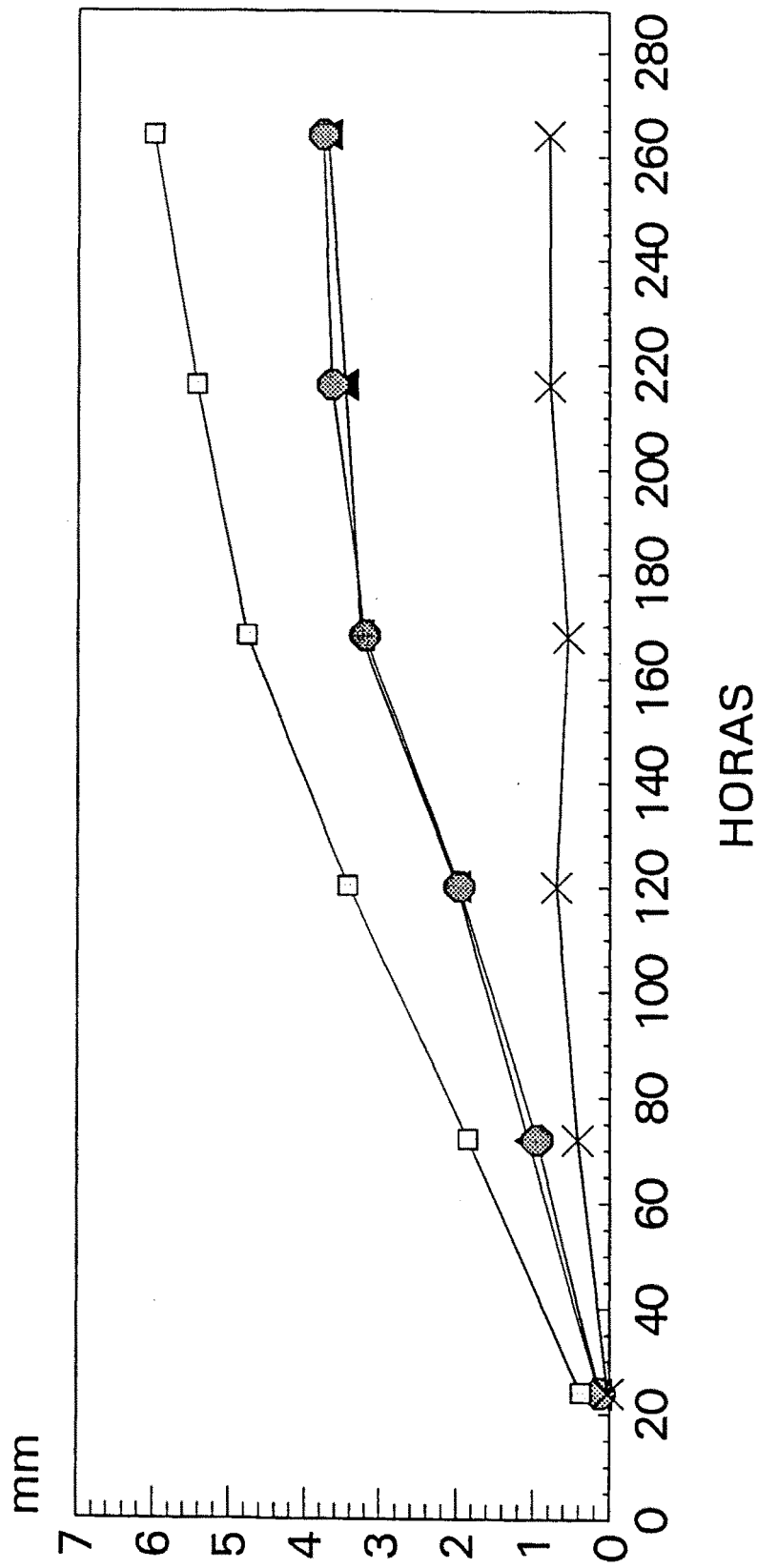
## Experimento 7



Espesores

# DESARROLLO DE LA BIOPELICULA

## Experimento 8



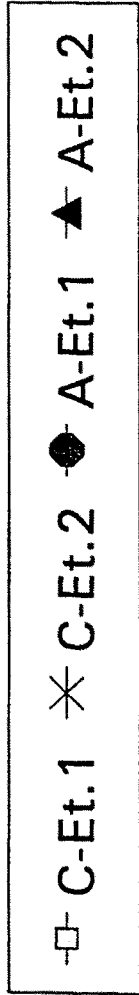
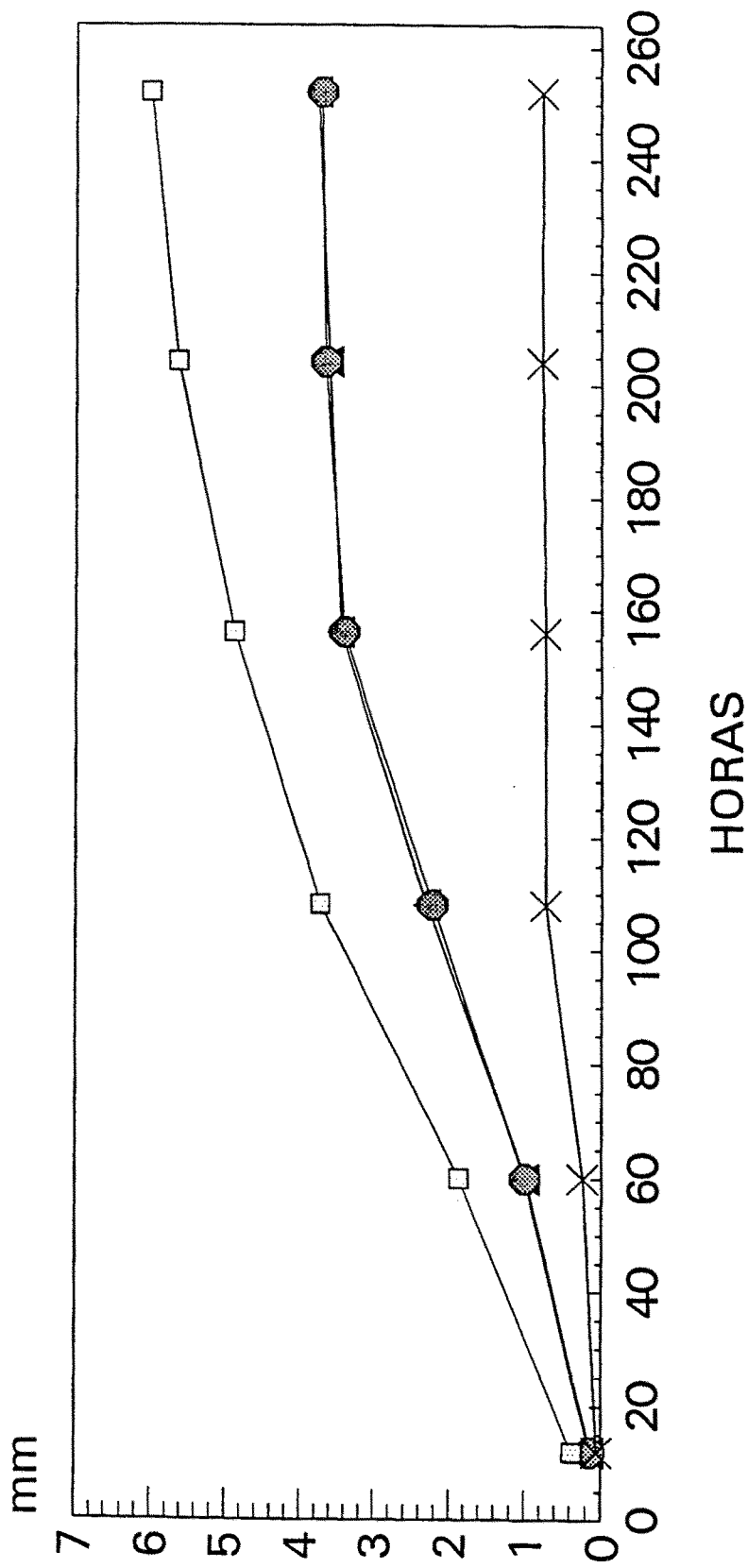
□ C-Et.1   × C-Et.2   ● A-Et.1   ▲ A-Et.2

Espesores



# DESARROLLO DE LA BIOPELICULA

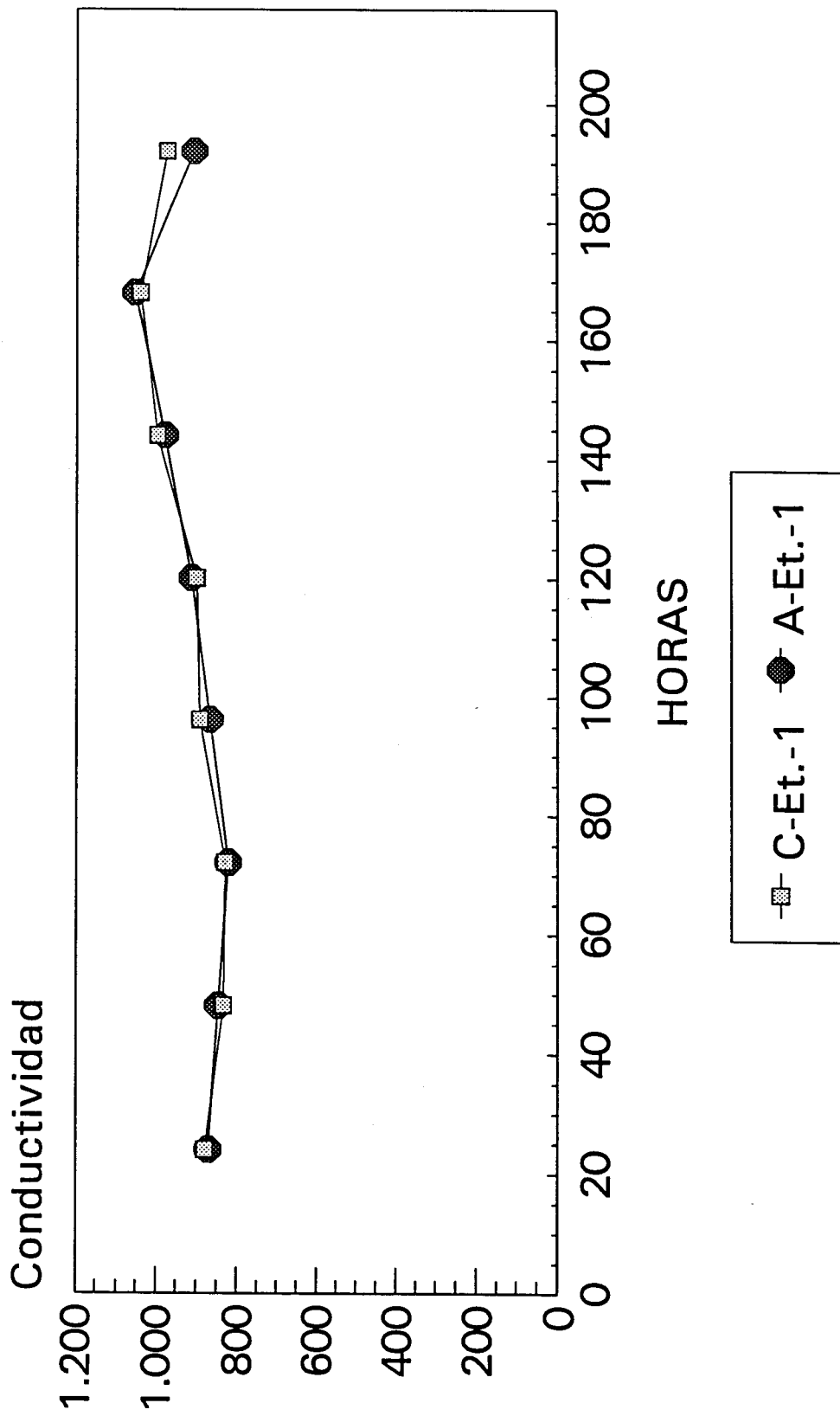
## Experimento 9



Esposores

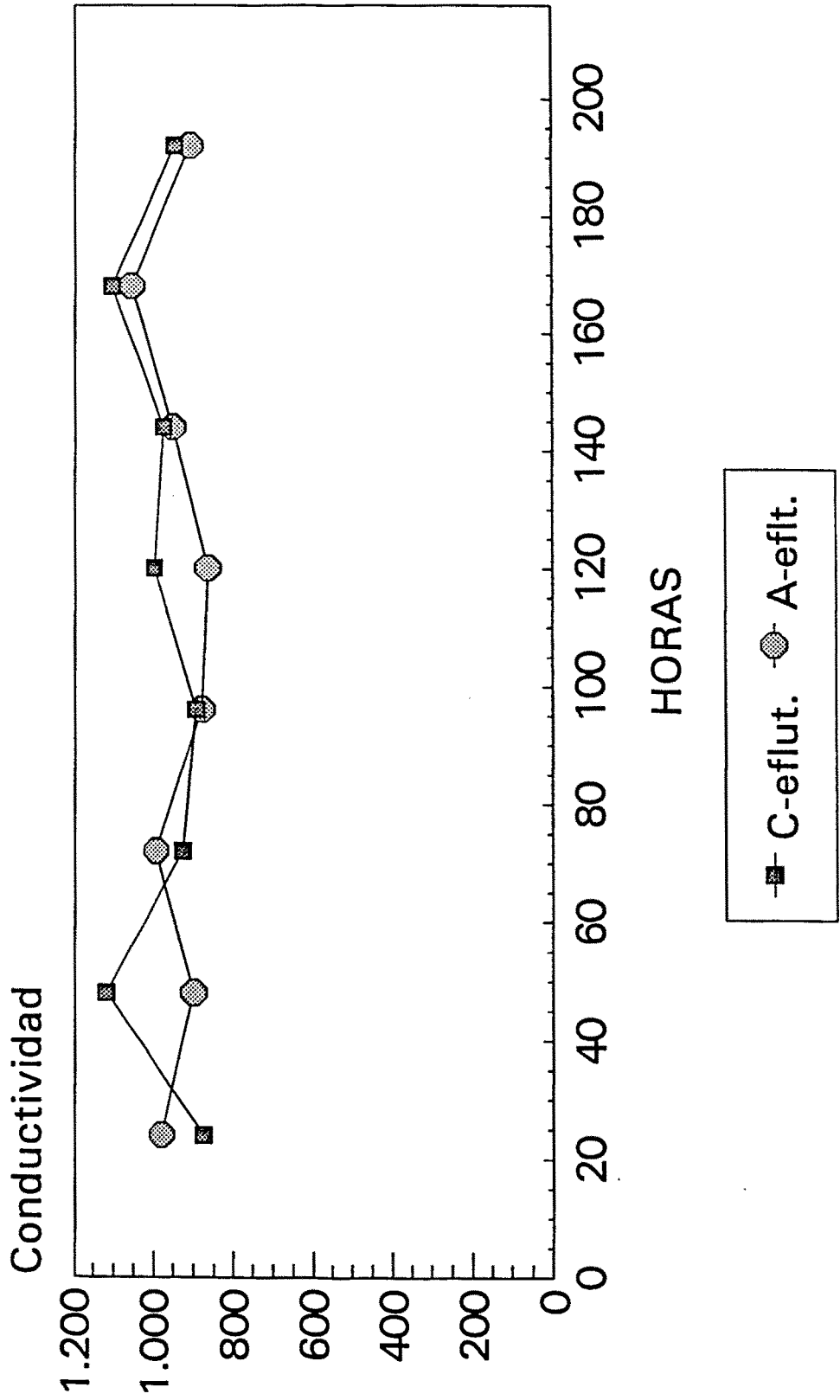
# DESARROLLO DE LA BIOPELICULA

## Experimento 1



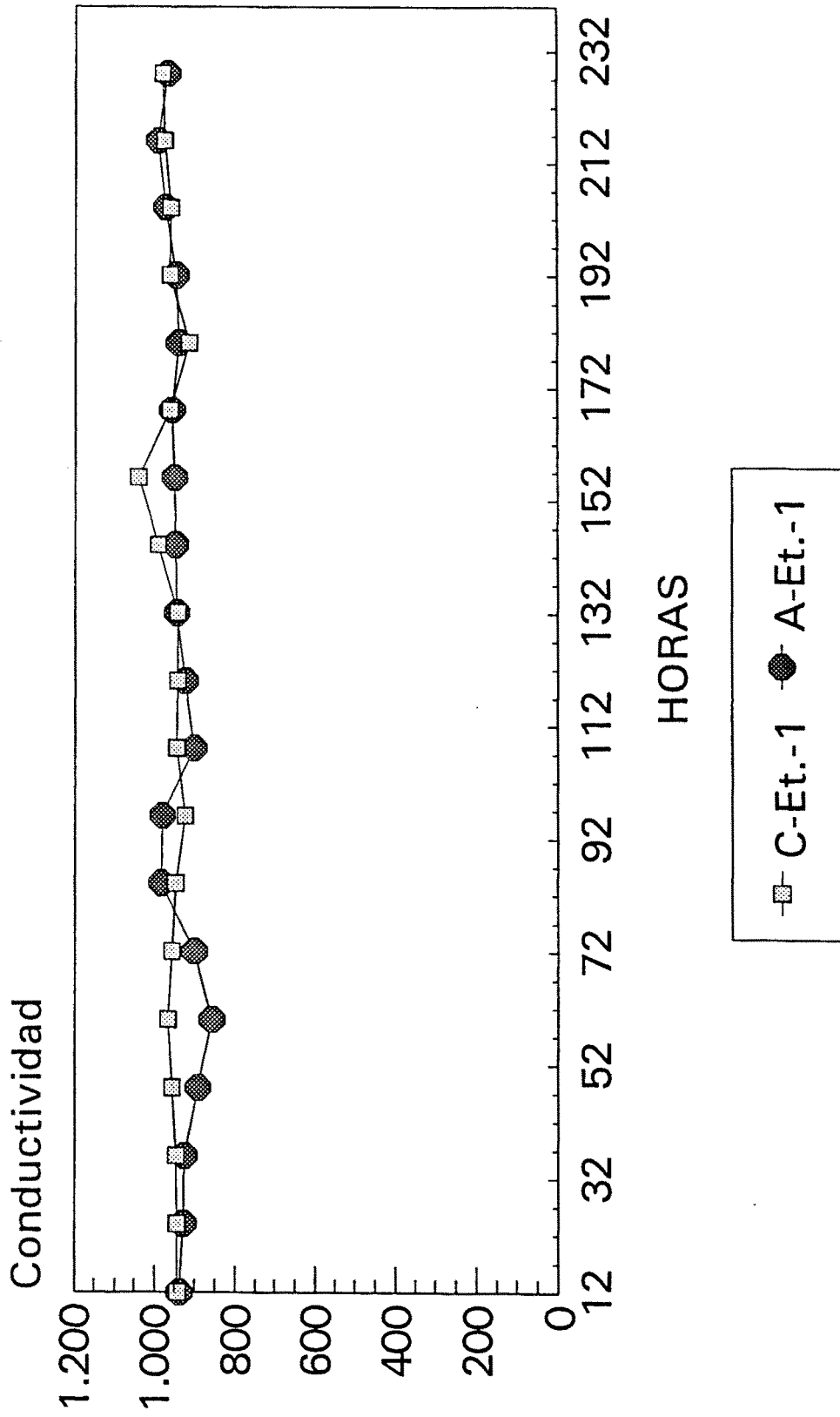
# DESARROLLO DE LA BIOPELICULA

## Experimento 1



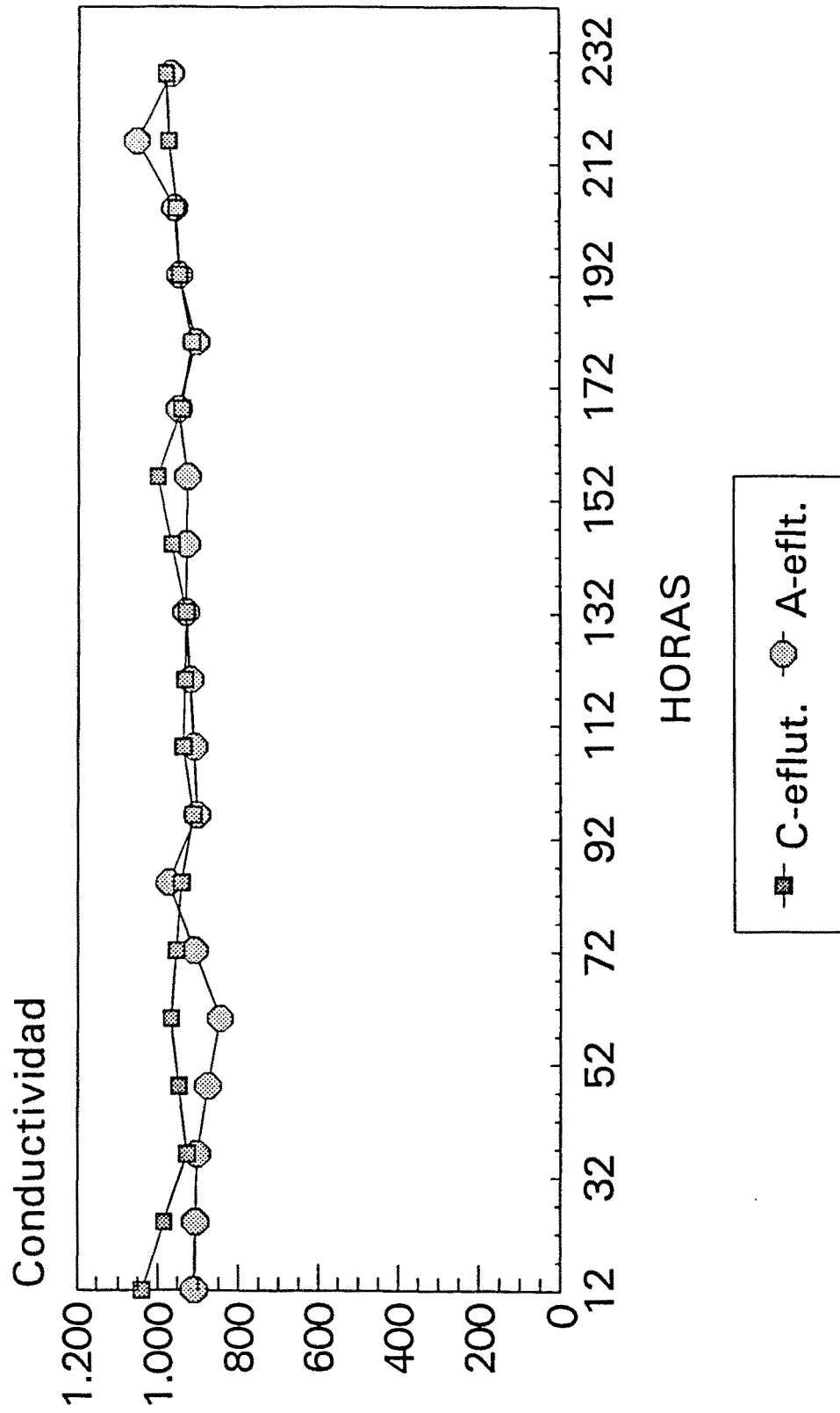
# DESARROLLO DE LA BIOPELICULA

## Experimento 2



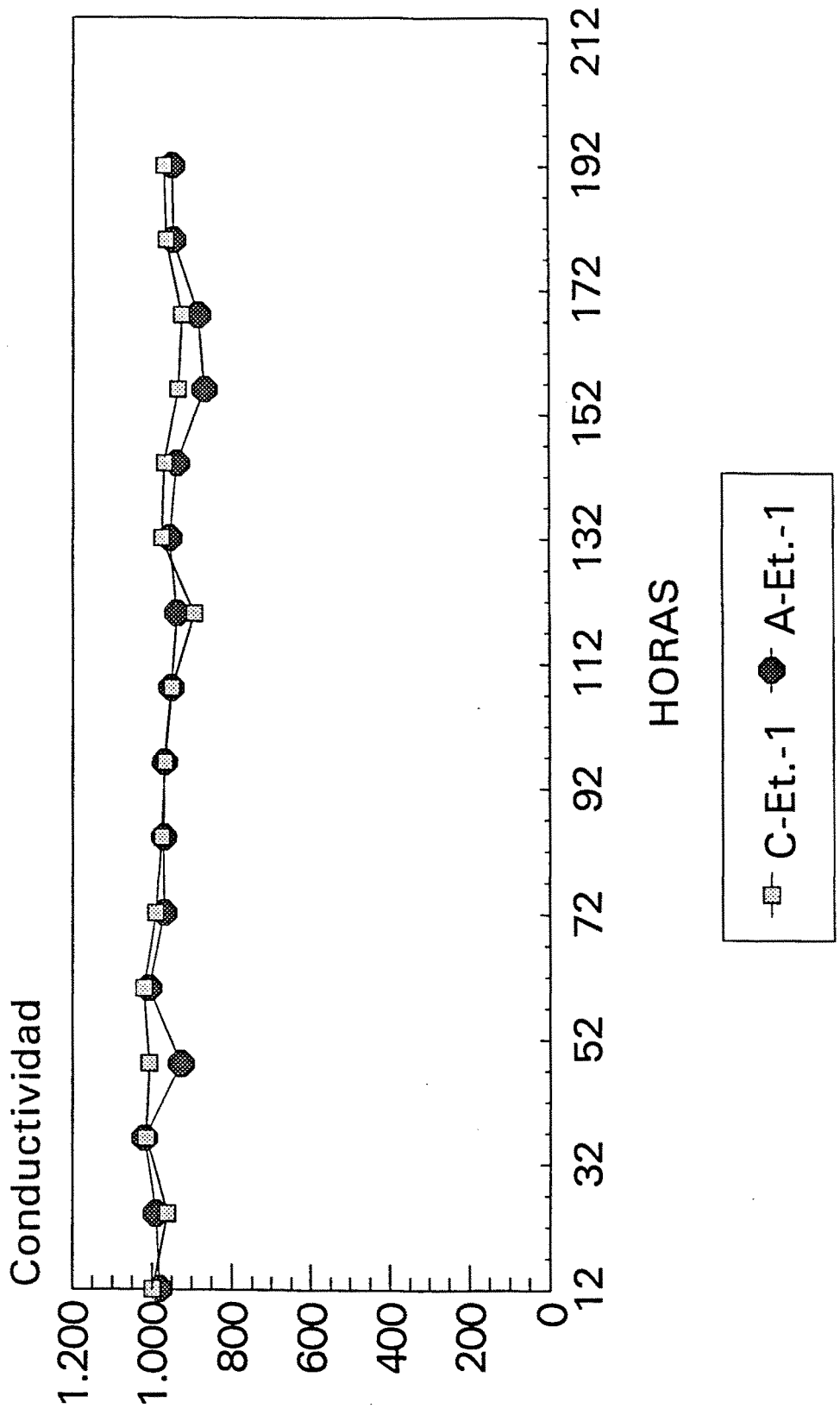
# DESARROLLO DE LA BIOPELICULA

## Experimento 2



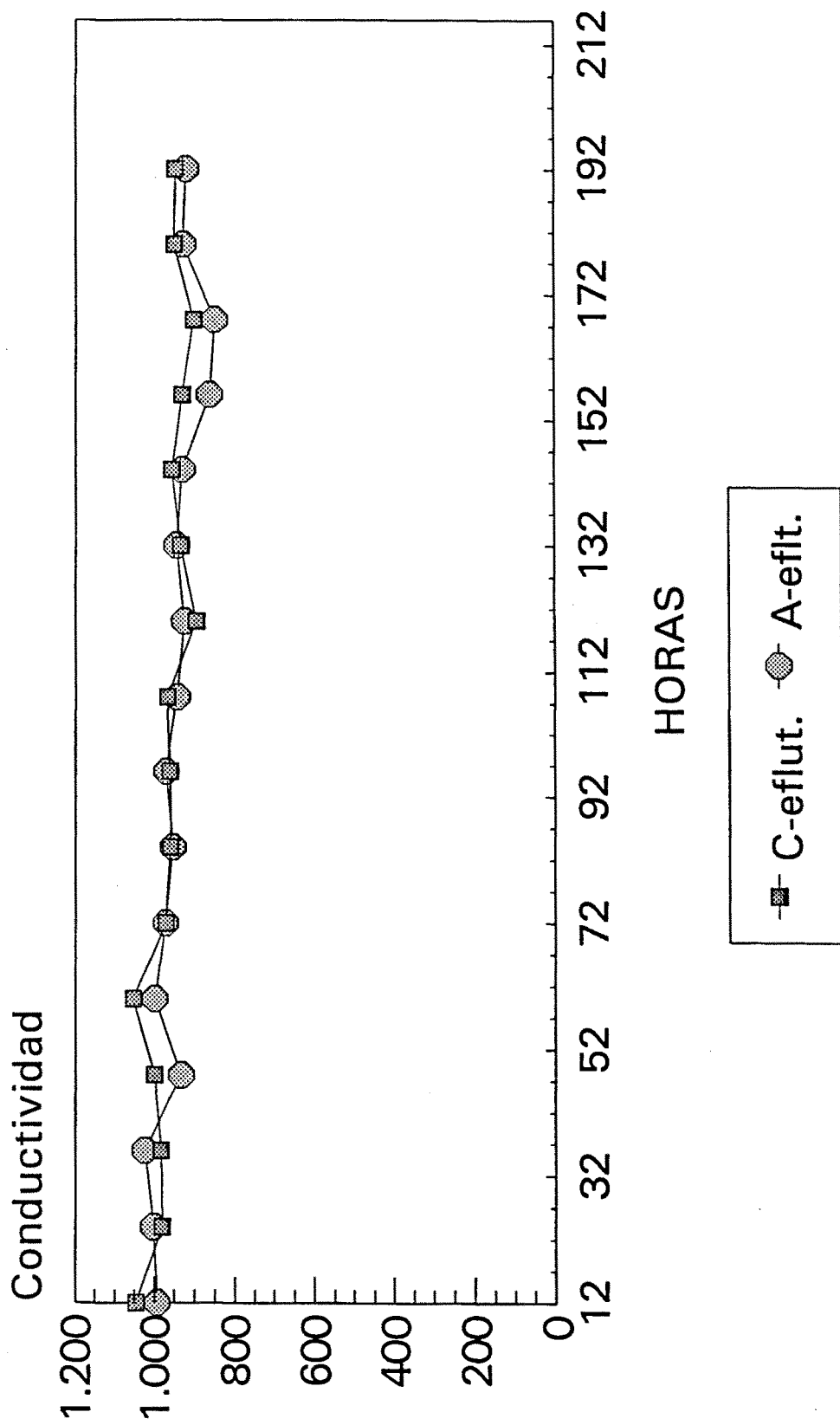
# DESARROLLO DE LA BIOPELICULA

## Experimento 3



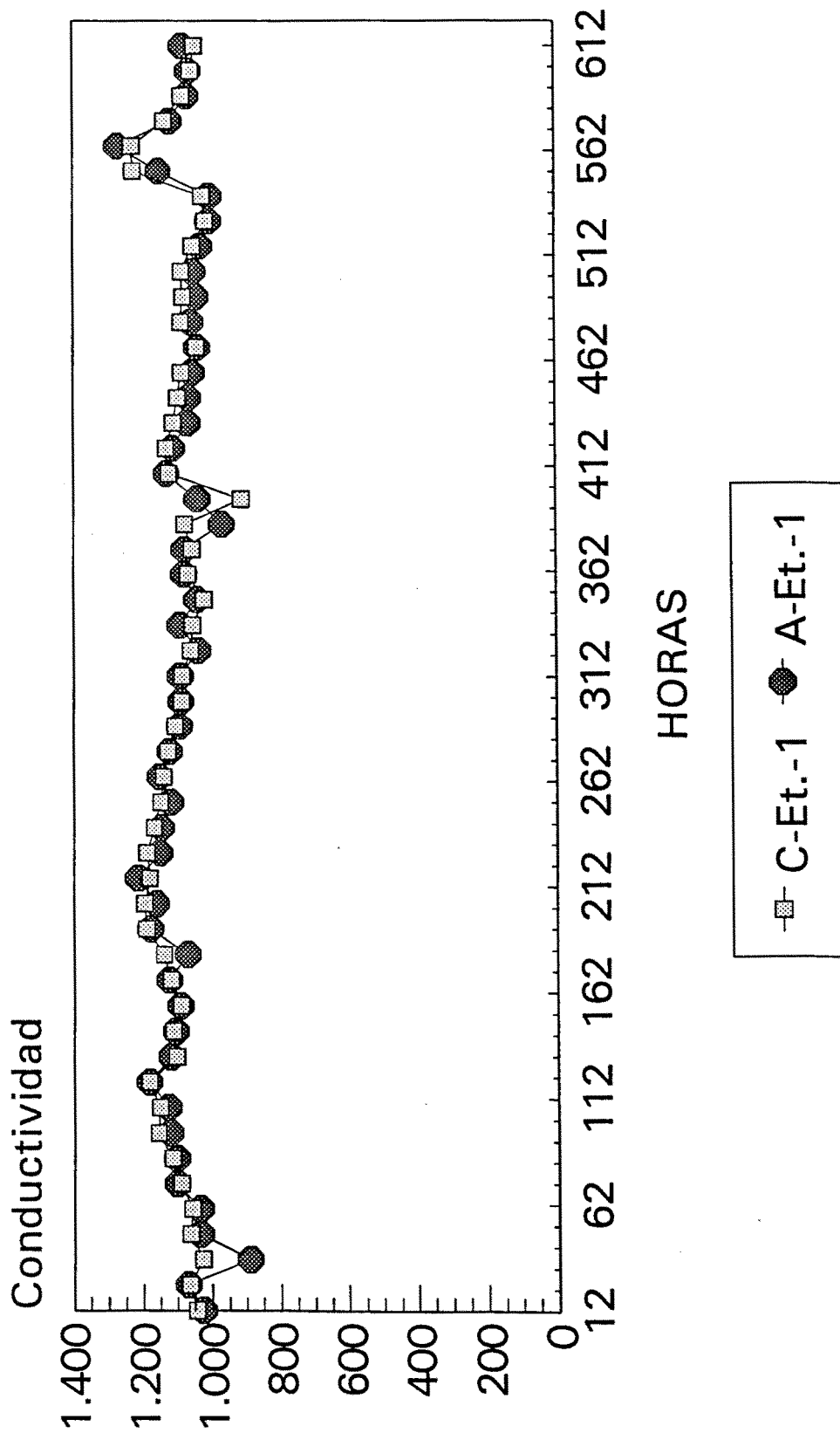
# DESARROLLO DE LA BIOPELICULA

## Experimento 3



# DESARROLLO DE LA BIOPELICULA

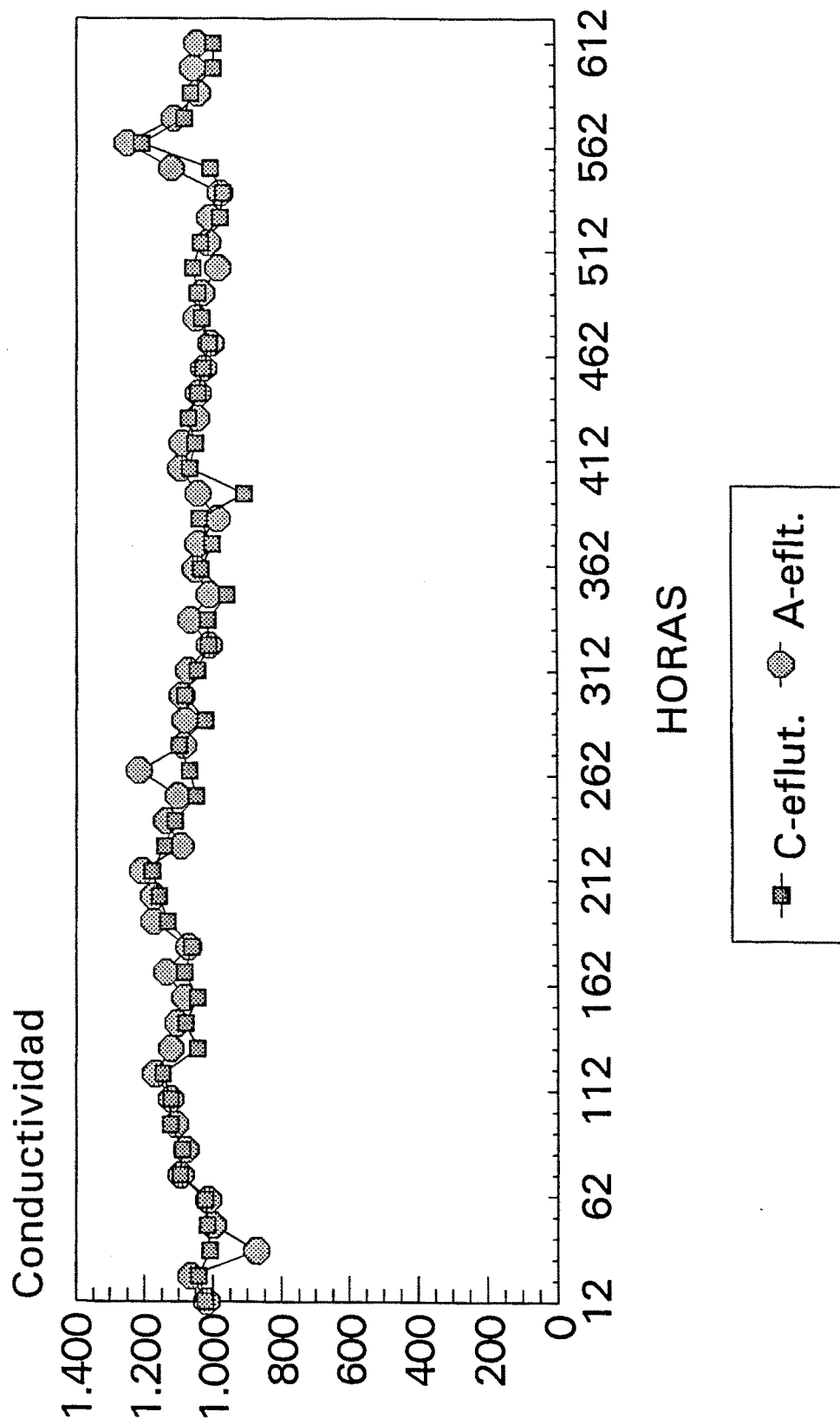
## Experimento 4





# DESARROLLO DE LA BIOPELICULA

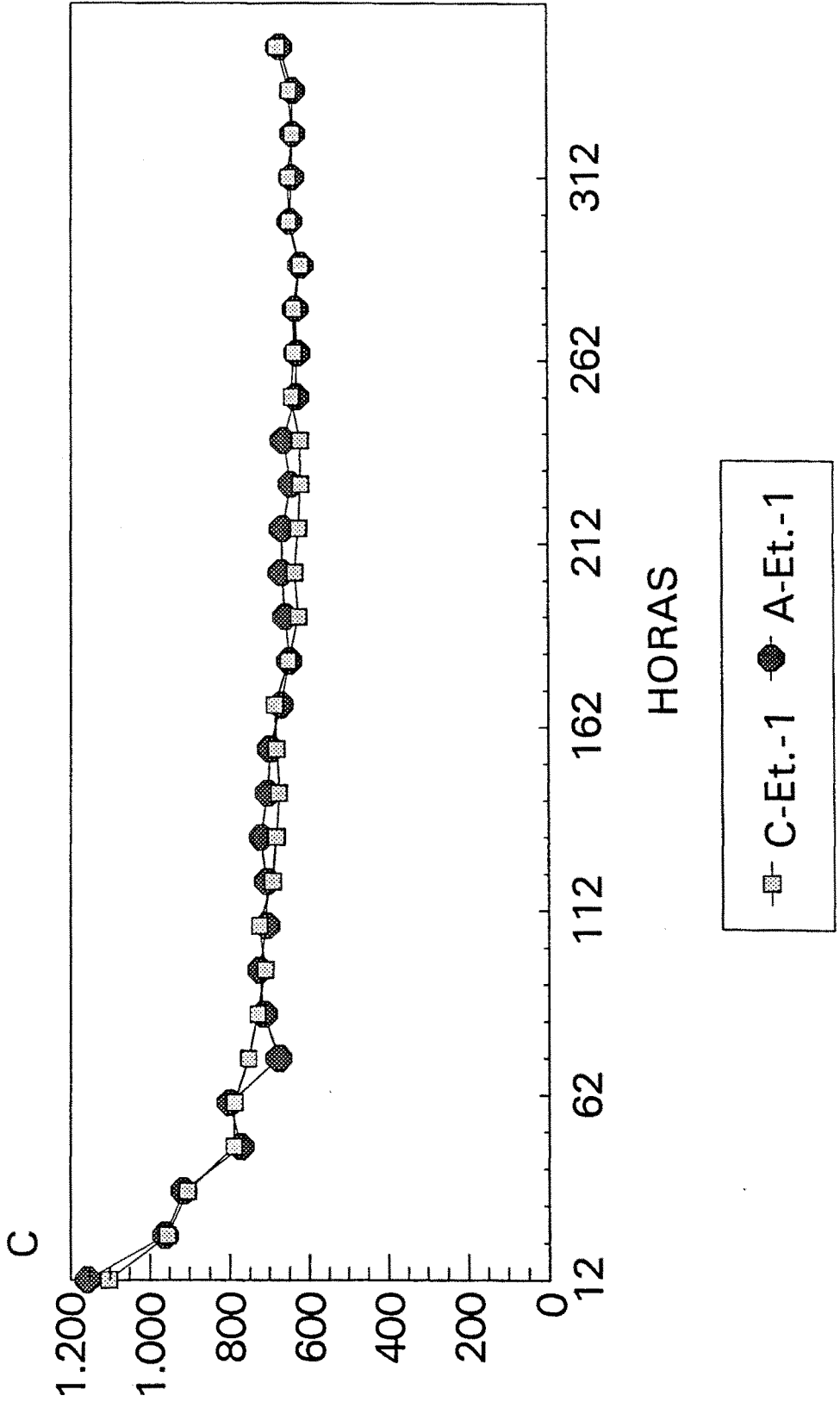
## Experimento 4



Efluente

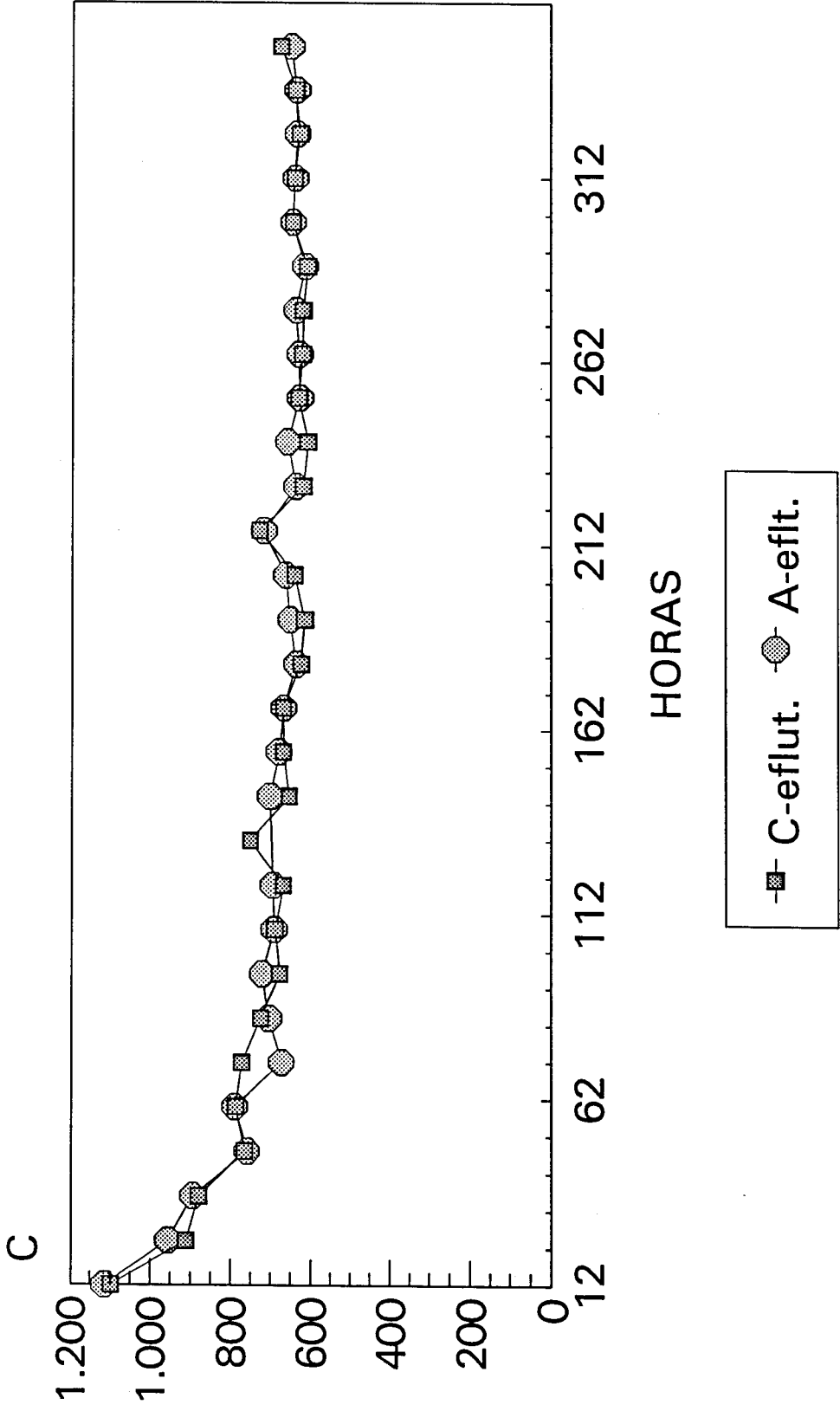
# DESARROLLO DE LA BIOPELICULA

## Experimento 5



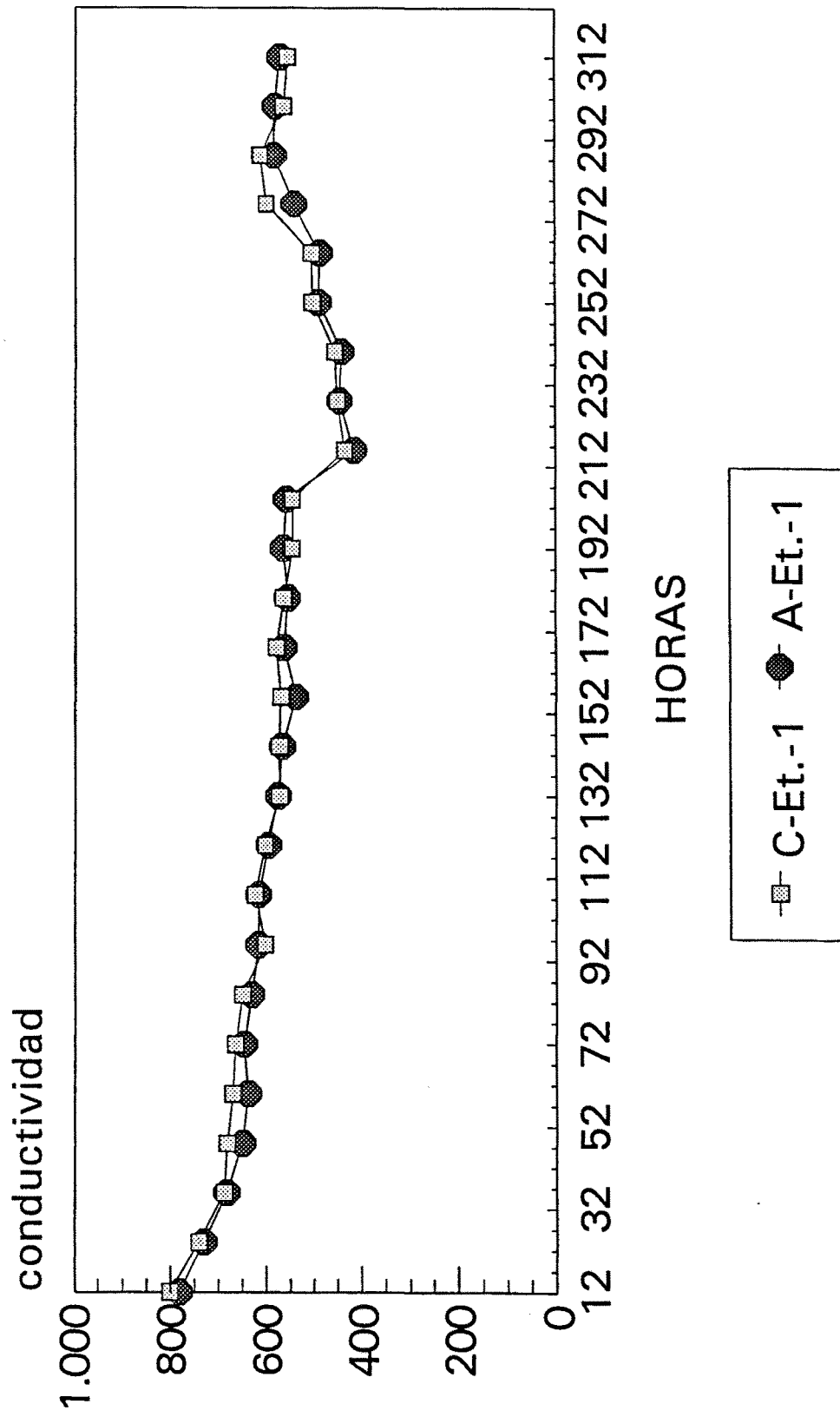
# DESARROLLO DE LA BIOPELICULA

## Experimento 5



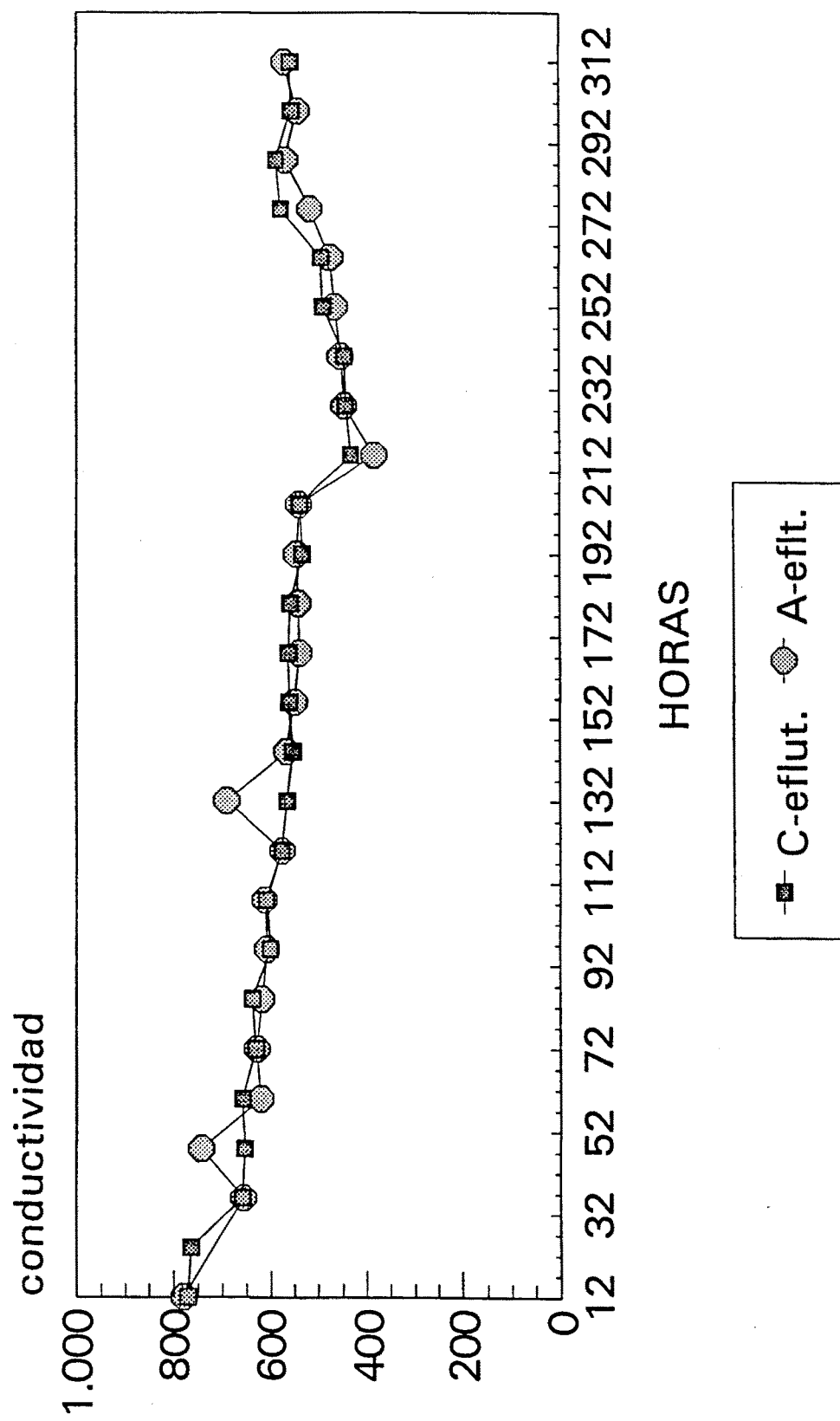
# DESARROLLO DE LA BIOPELICULA

## Experimento 6



# DESARROLLO DE LA BIOPELICULA

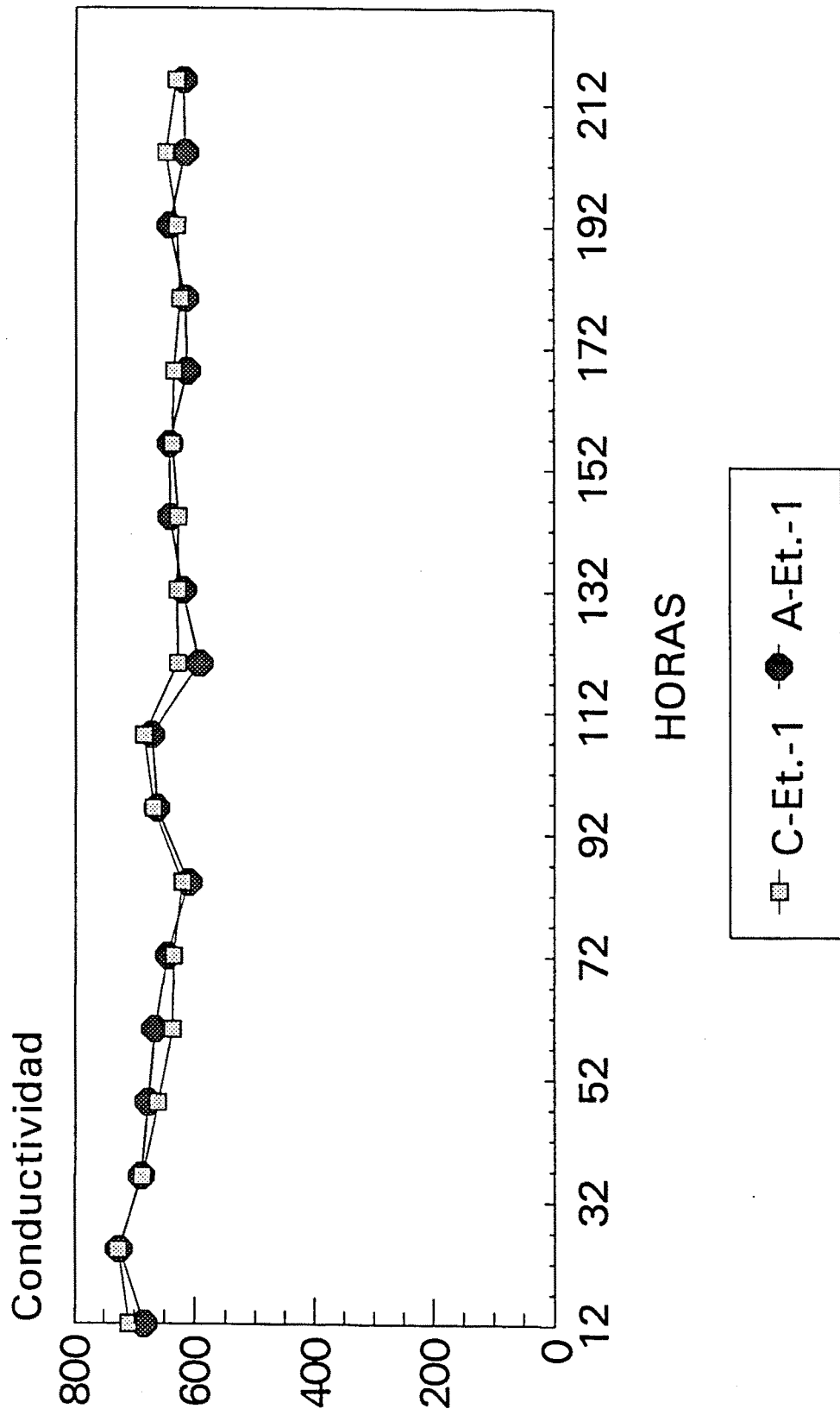
## Experimento 6



Efluente

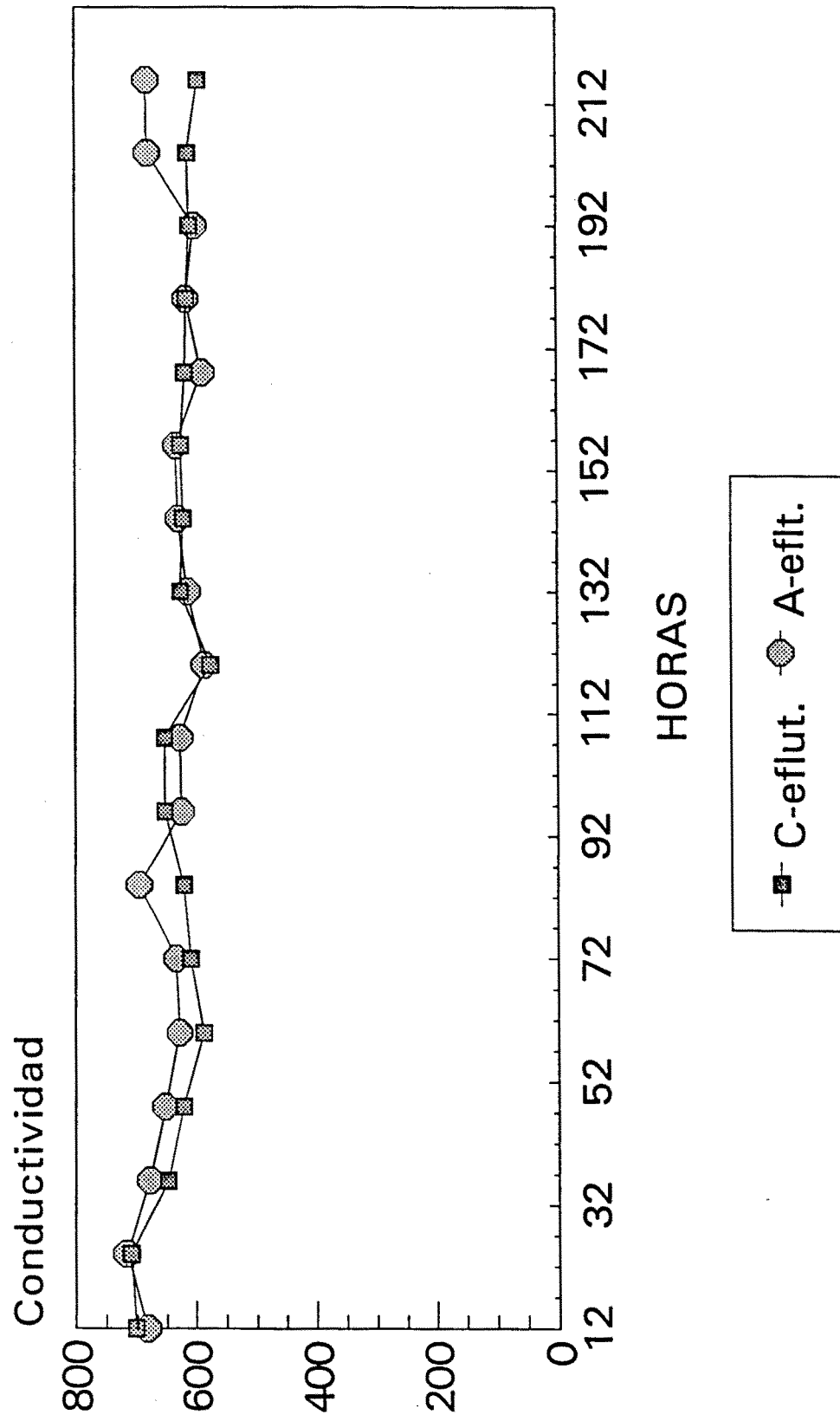
# DESARROLLO DE LA BIOPELICULA

## Experimento 7



# DESARROLLO DE LA BIOPELICULA

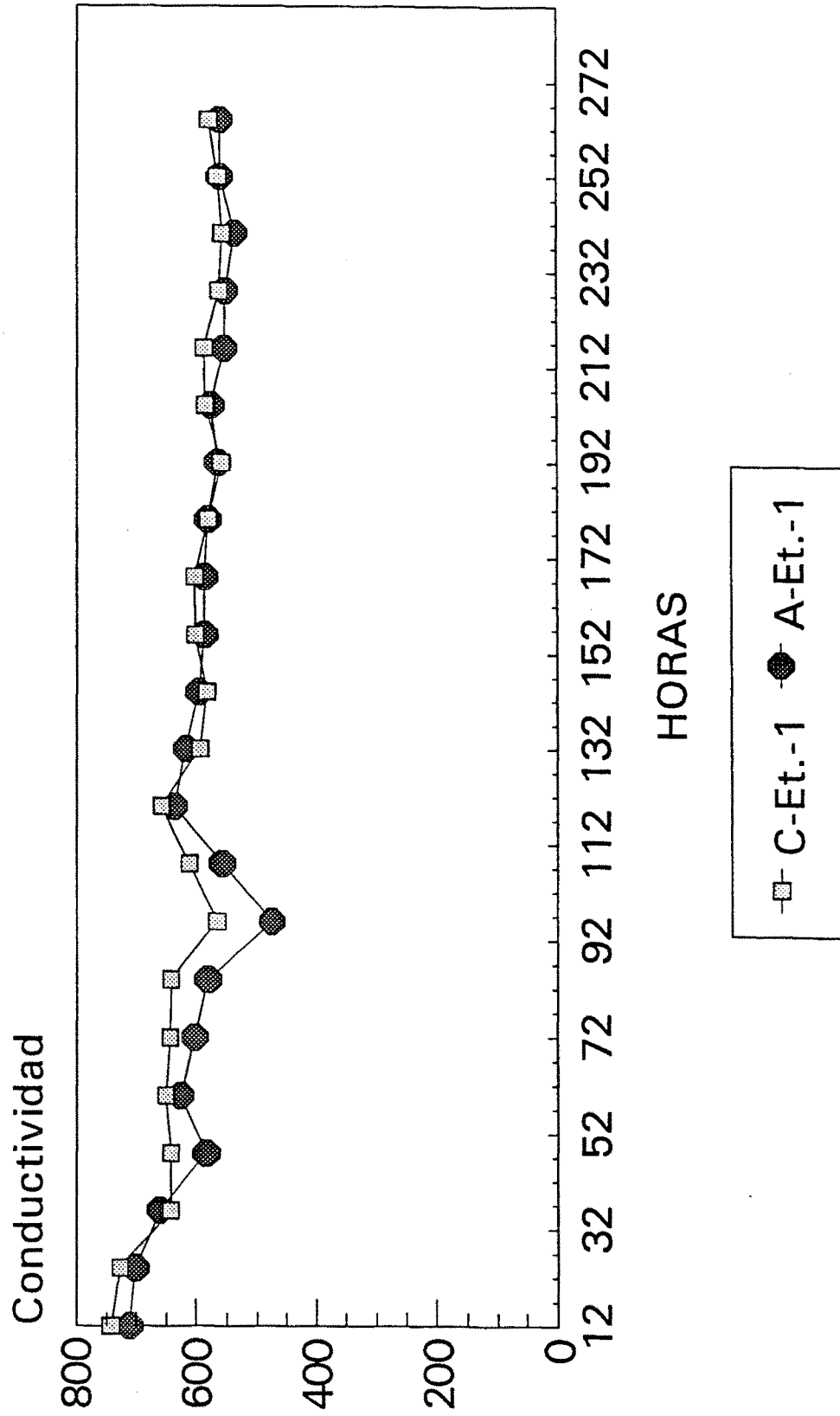
## Experimento 7



Efluente

# DESARROLLO DE LA BIOPELICULA

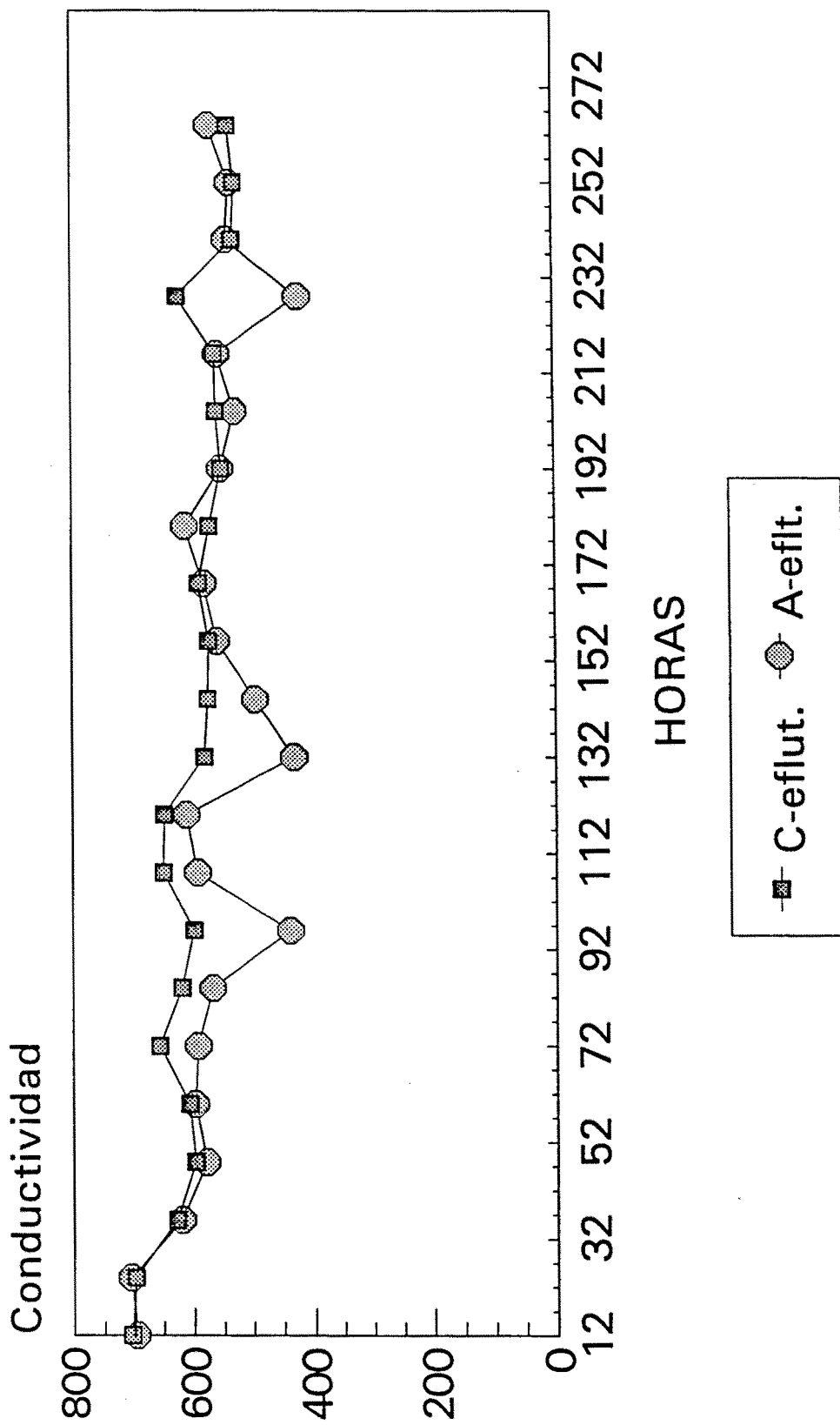
## Experimento 8





# DESARROLLO DE LA BIOPELICULA

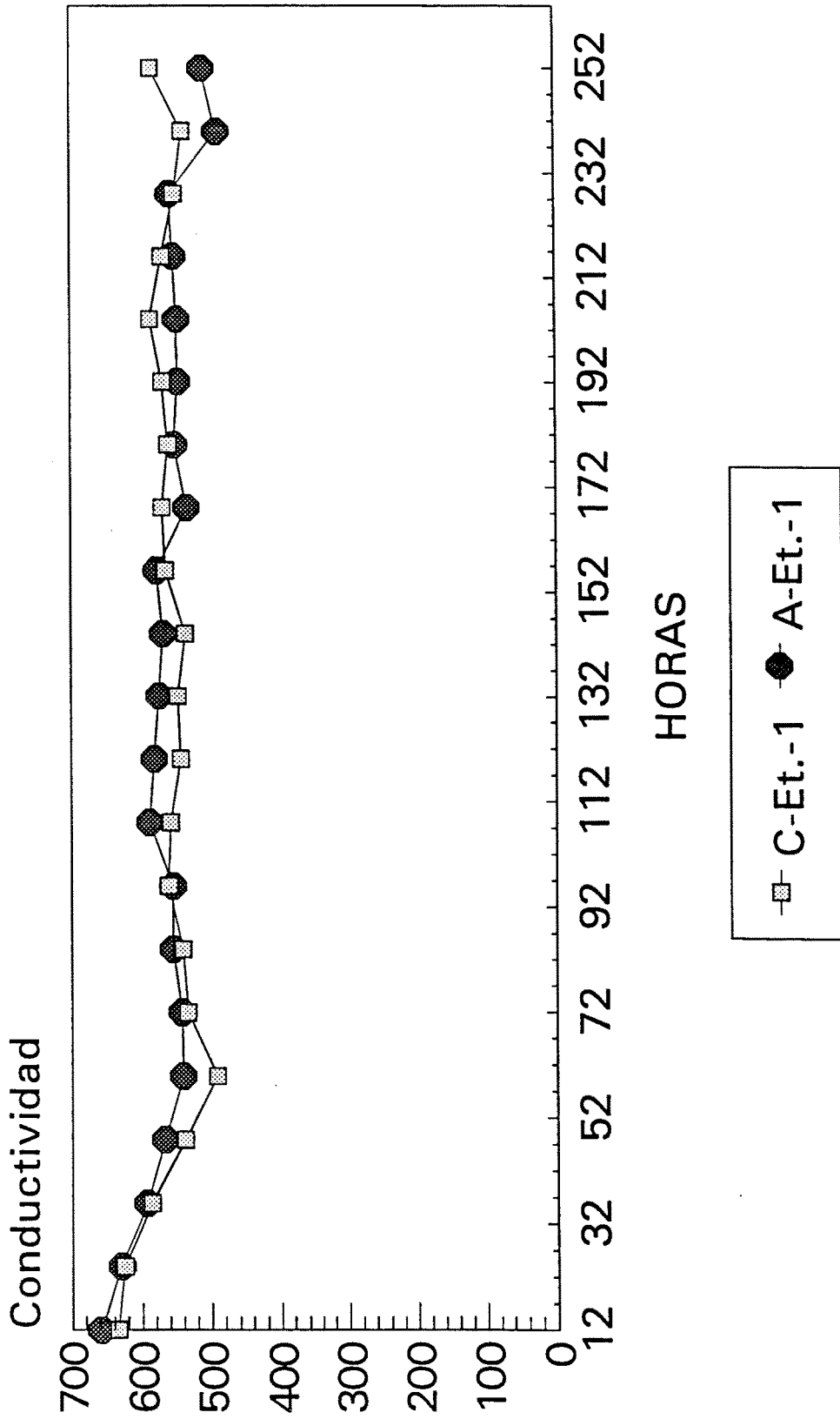
## Experimento 8



Efluente

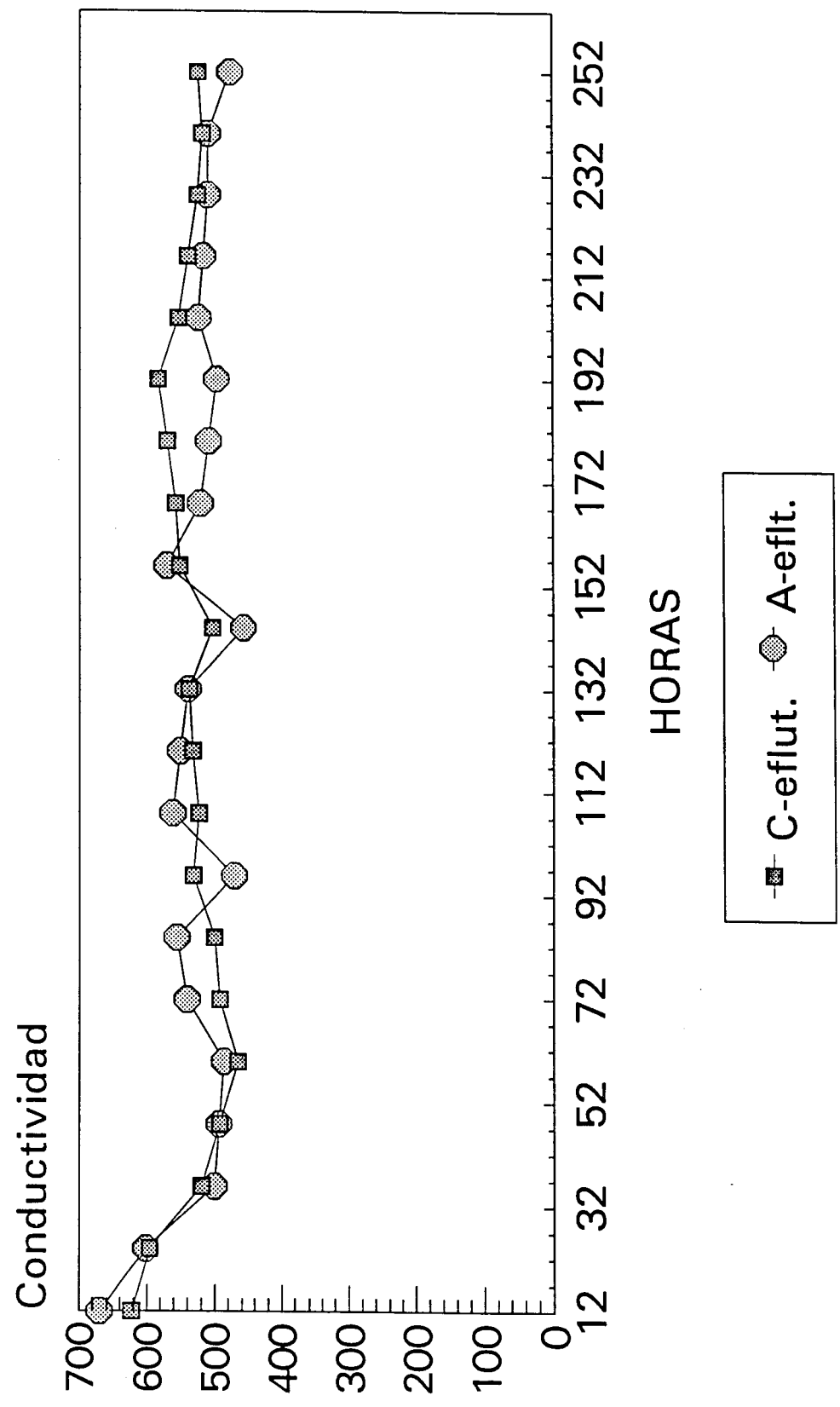
# DESARROLLO DE LA BIOPELICULA

## Experimento 9



# DESARROLLO DE LA BIOPELICULA

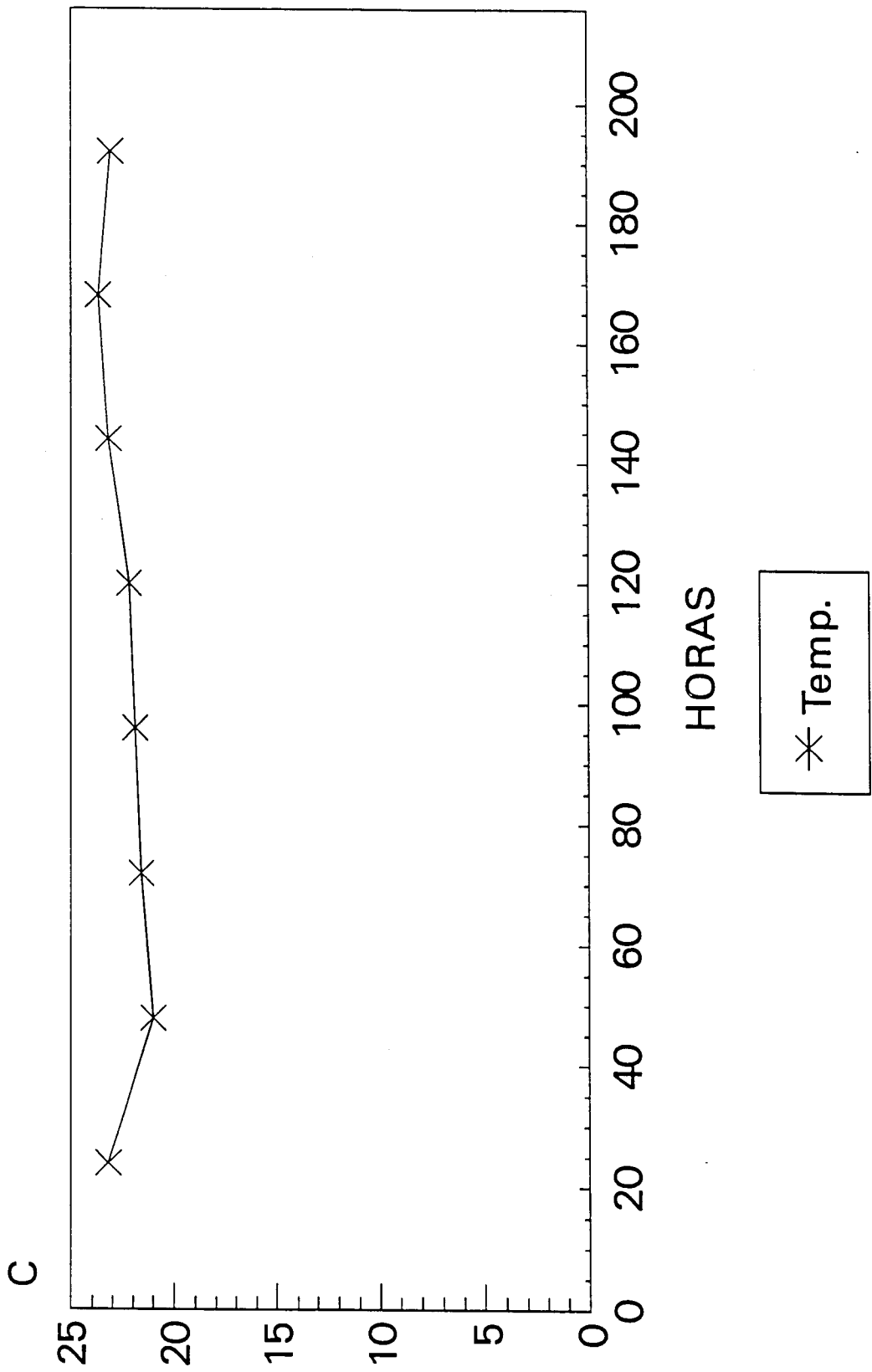
## Experimento 9



Efluente

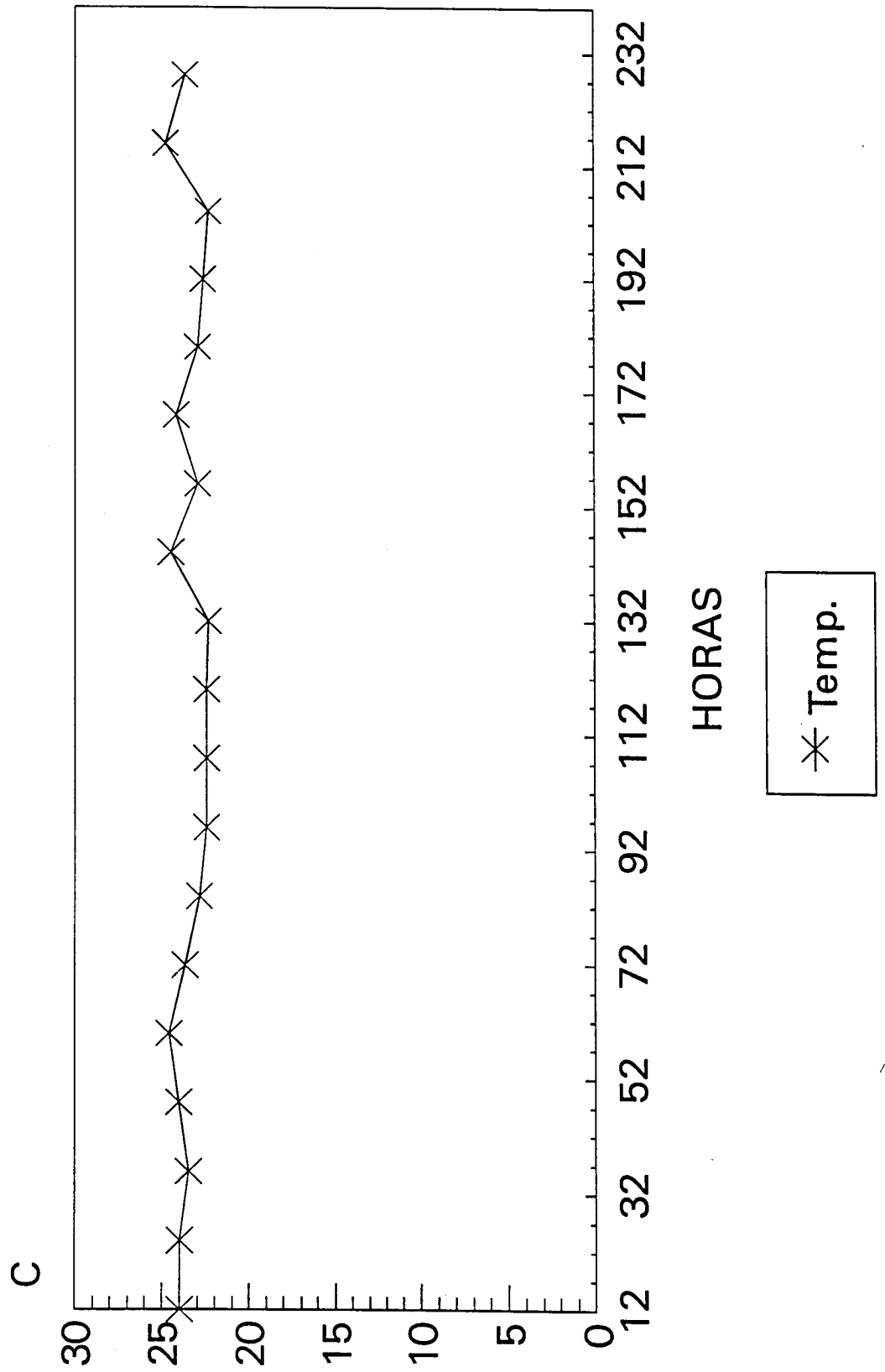
# DESARROLLO DE LA BIOPELICULA

## Experimento 1



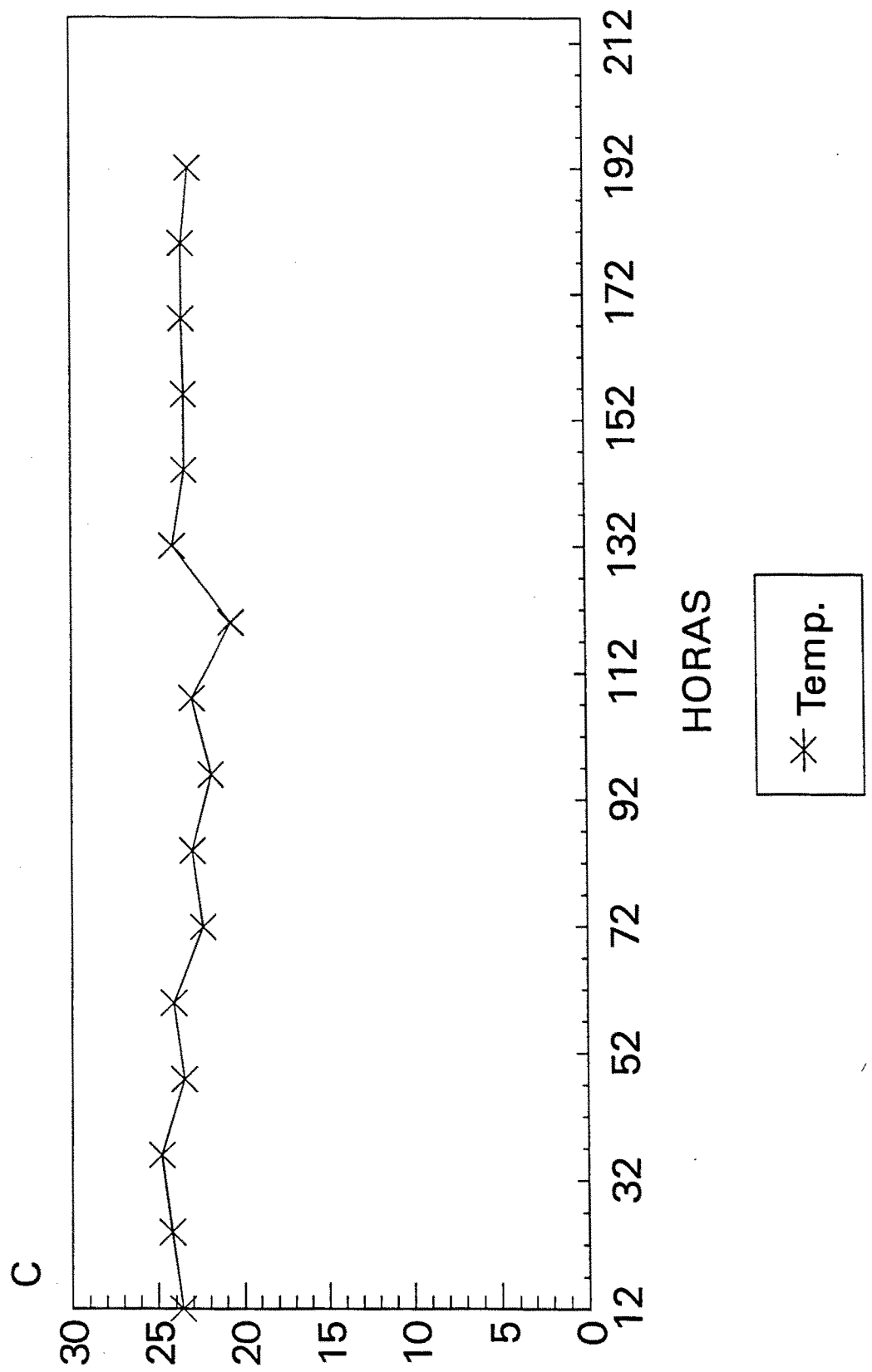
# DESARROLLO DE LA BIOPELICULA

## Experimento 2



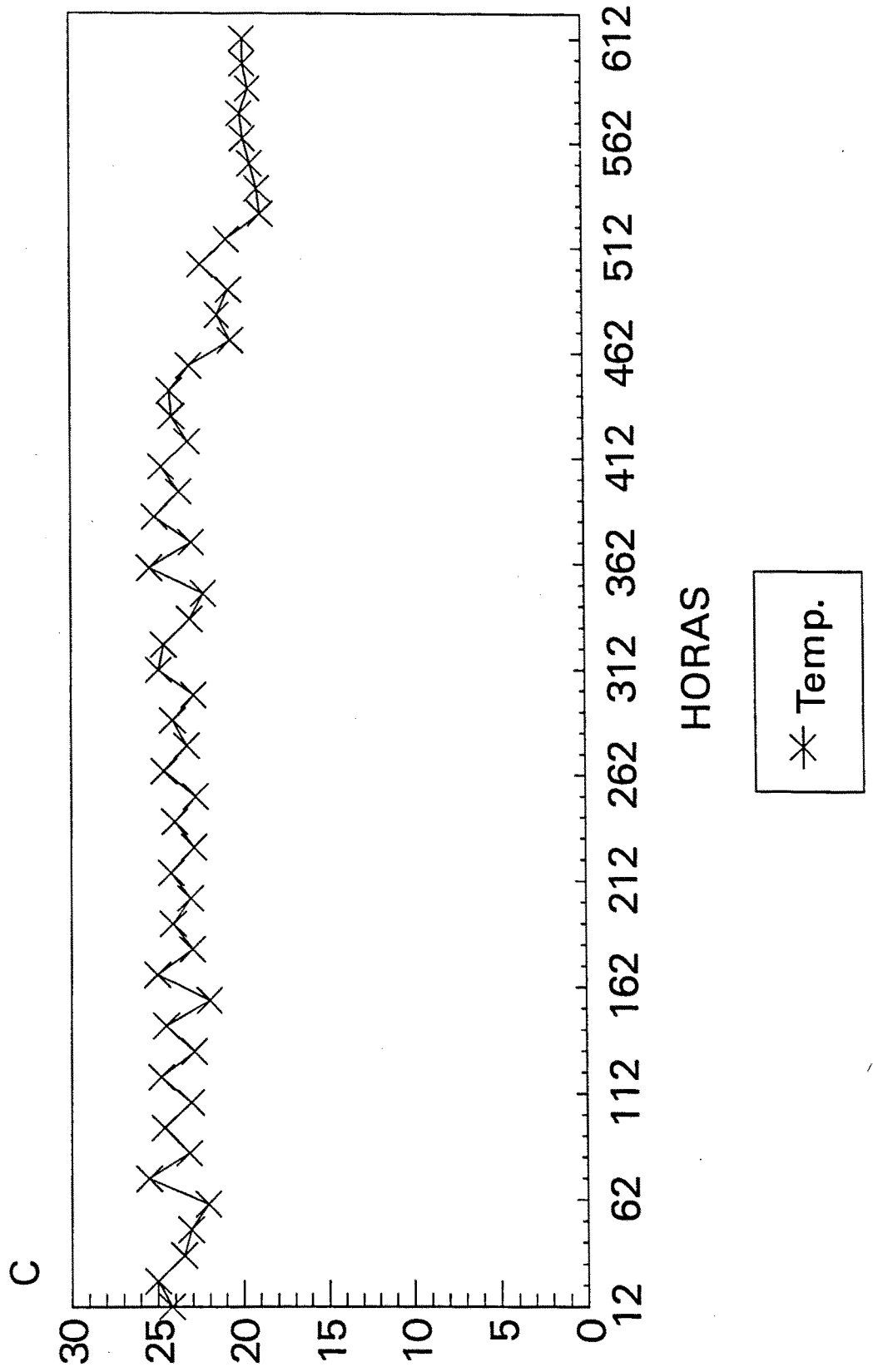
# DESARROLLO DE LA BIOPELICULA

## Experimento 3



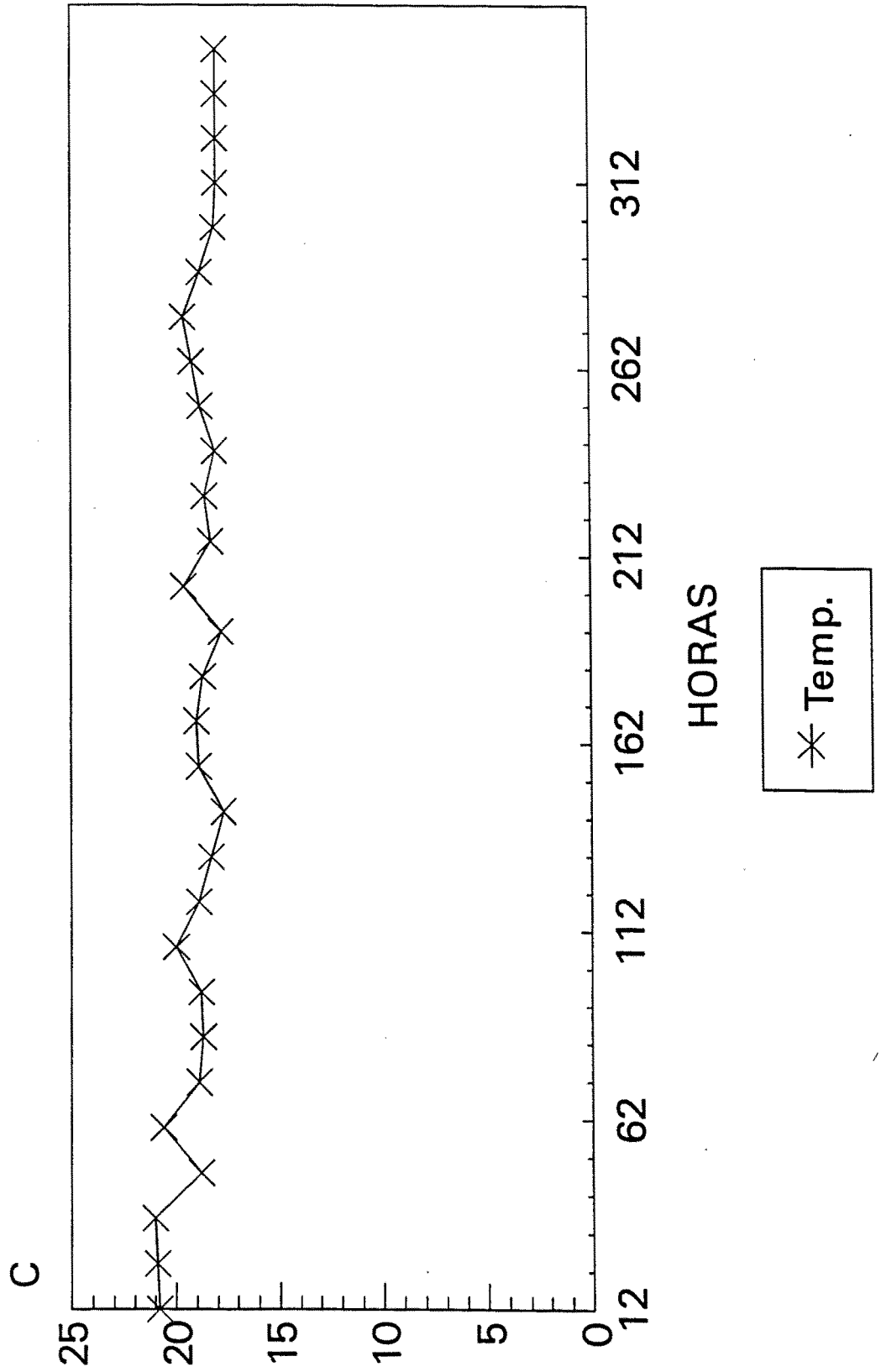
# DESARROLLO DE LA BIOPELICULA

## Experimento 4



# DESARROLLO DE LA BIOPELICULA

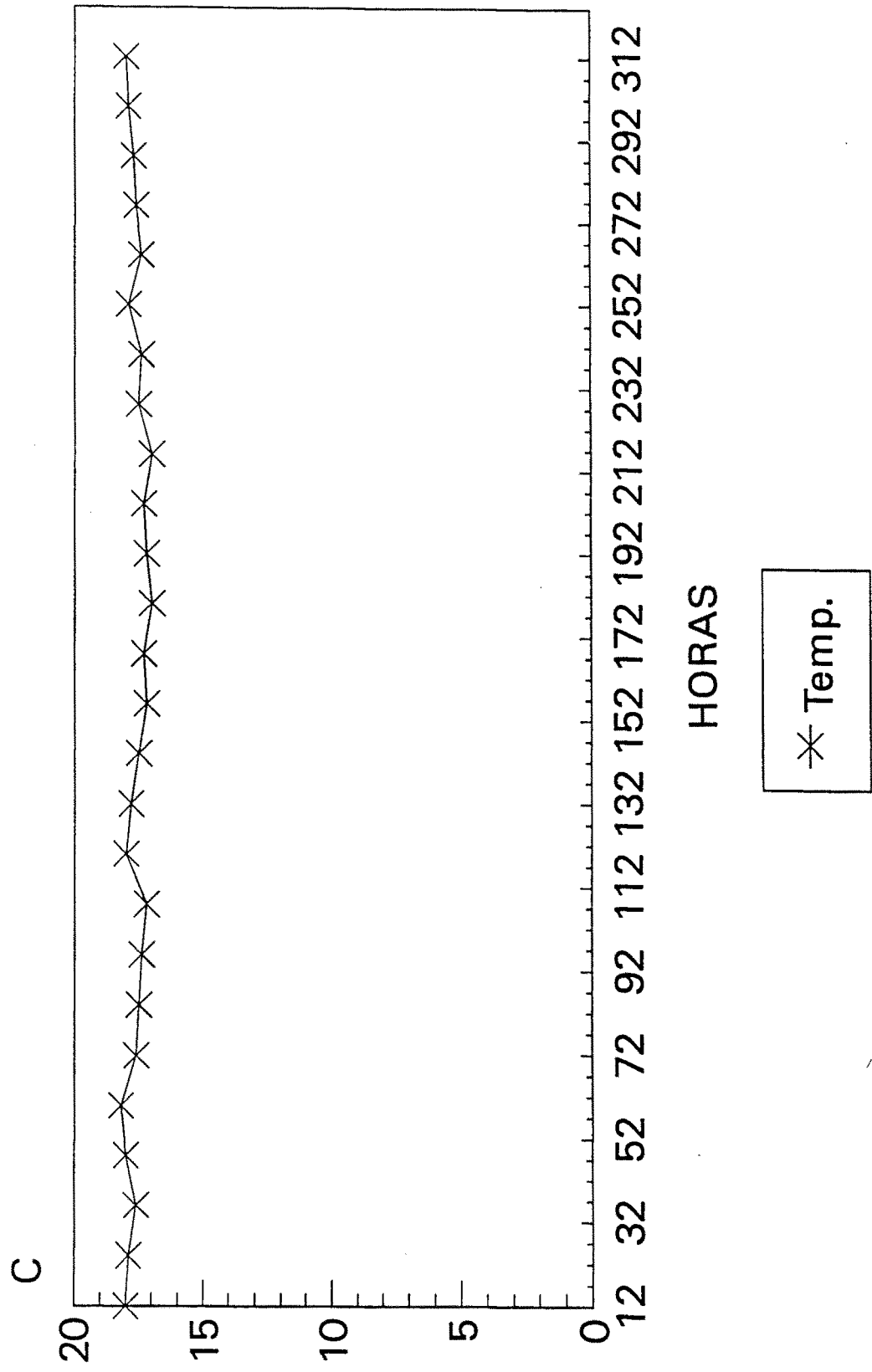
## Experimento 5





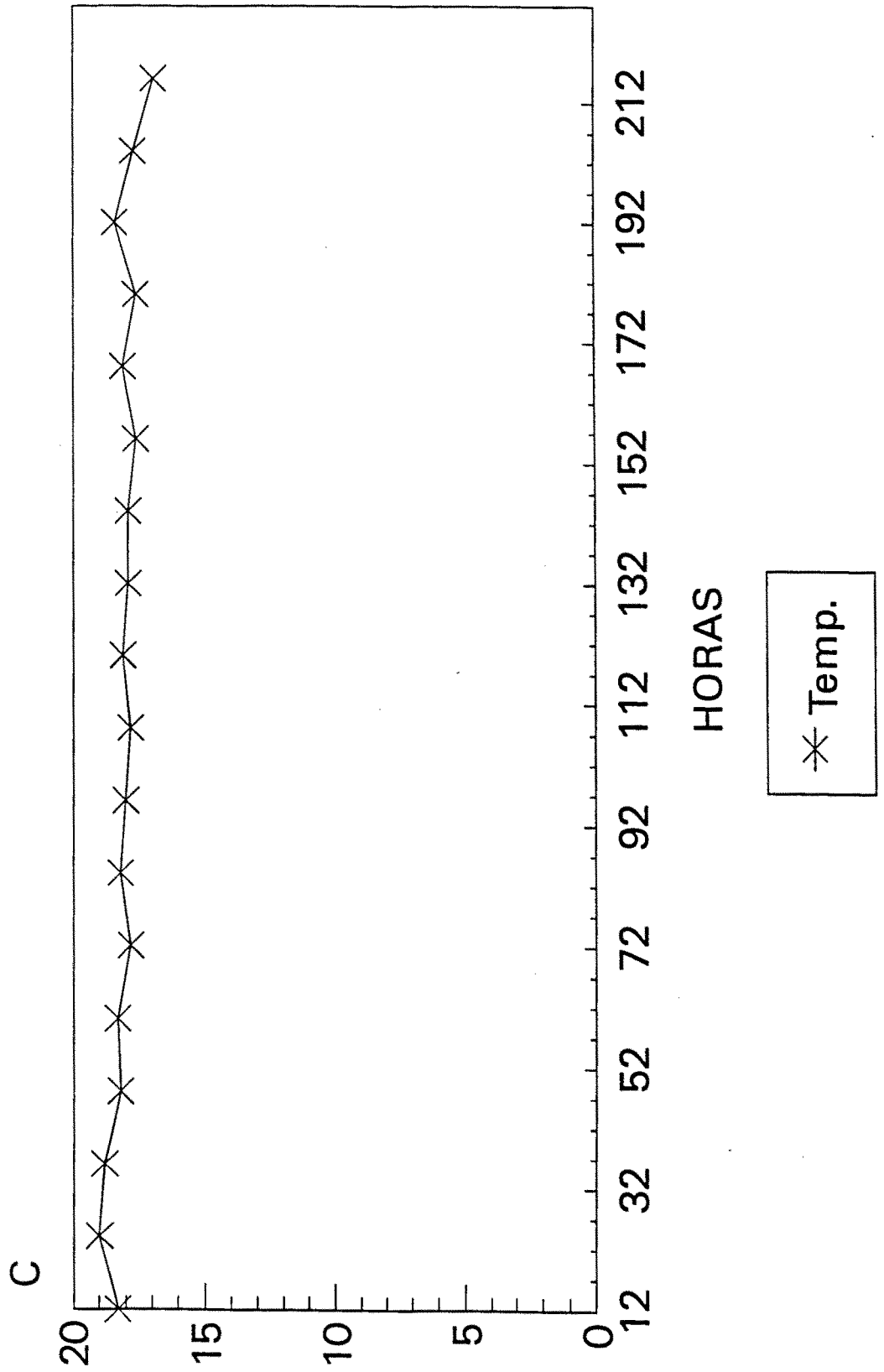
# DESARROLLO DE LA BIOPELICULA

## Experimento 6



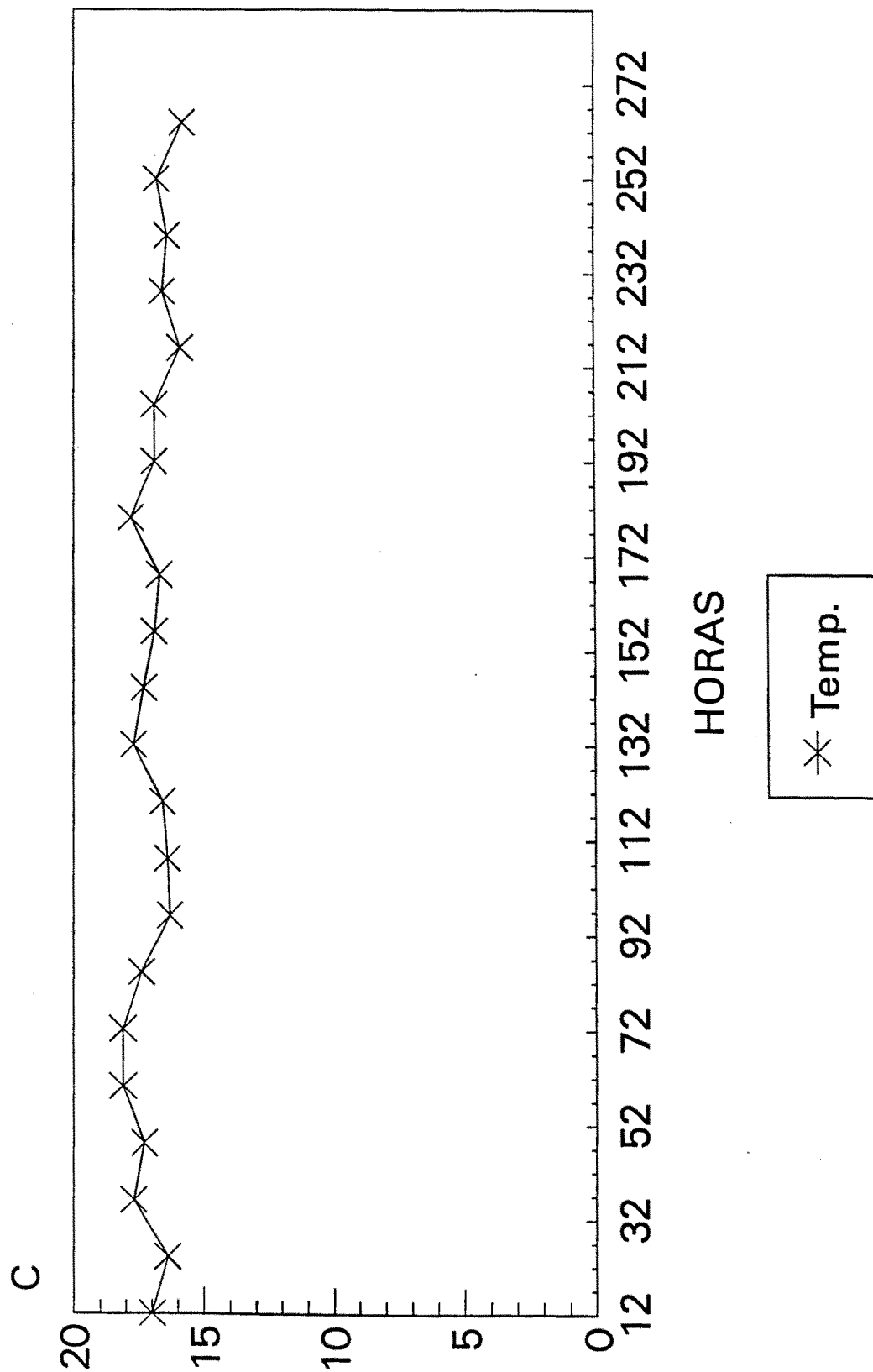
# DESARROLLO DE LA BIOPELICULA

## Experimento 7



# DESARROLLO DE LA BIOPELICULA

## Experimento 8



# DESARROLLO DE LA BIOPELICULA

## Experimento 9

