

Capítulo 7

REFERENCIAS BIBLIOGRÁFICAS

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Albonetti S., Cavani F. y Trifiró F., “Key Aspects in Catalyst Design for the Selective Oxidation of Paraffins”, *Catal. Rev. Sci. Eng.*, **38**, 413 (1996)

Alkazhov, T.G. y Lisovskii, A. E. (1980) « Oxidative Dehydrogenation of Hydrocarbons ». Russian, Khimia. Moscú.

Andersen, P.J. ; Kung, H.H (1993) “The effect of oxygen binding energy on the selective oxidation of butane over vanadium/ γ -alumina. Studies in Surface”. *Science and Catalysis* **75**, 205-217.

Andersen, P.J. ; Kung, H.H ; « Proceeding of the 10th Int. Cong. Catal. » Budapest, pag 12 (1992)

Aouine, M., Dubois, J.L. Millet, J.M.M. (2001) “Crystal Chemistry and phase composition of the MoVTeNbO catalysts for the ammoxidation of propane”. *Chemical Communications* 1180-1181.

Aramendia, MA., Aviles, Y., Borau, V., Luque, J. M., Marinas, J.M., Ruiz, J.R., Urbano, F.J. (1999) “Thermal decomposition of Mg/Al and Mg/Ga layered-double hydroxides: a spectroscopic study”. *Journal of Materials Chemistry*. **9** 1603.

Argyle, M.D., Chen, K., Resini, C., Krebs, C., Bell, A.T., Iglesia, E. (2004) “Extent of Reduction of Vanadium Oxides during Catalytic Oxidation of Alkanes Measured by in-Situ UV-Visible Spectroscopy.” *Journal of Physical Chemistry*. **108**, 2345-2353.

Aritani, H., Tanaka, T., Funabiki, T., Yoshida, S., Eda, K., Sotani, N., Kudo, M., Hasegawa, S., (1996) “Study of the Local Structure of Molybdenum-Magnesium Binary Oxides by Means of Mo L₃-Edge XANES and UV-Vi₃ Spectroscopy”. *Journal of Physical Chemistry*. **100**, 19495-19501.

Armendariz y col., (1988). “Estudio de catalizadores para la deshidrogenacion oxidativa de Hidrocarburos” XI Simposio Iberoamericano de Catalisis Guanajuato, 975 – 981.

Armendariz, H.; Aguilar-Rios, G.; Salas, P.; Valenzuela, M. A.; Schifter, I.; Arriola, H.; Nava, N. (1992) « Oxidative dehydrogenation of n-butane on iron-zinc oxide catalysts ». *Applied Catalysis, A: General*, **92(1)**, 29-38

Bañares, M.; (1999) “Supported metal oxide and other catalysts for ethane conversion: a review” *Catalysis. Today*, **51**(2), 319-348

Barsan, M. M.; F. C. Thyron, (2003) “Kinetic study of oxidative dehydrogenation of propane over Ni-Co molybdate catalyst” *Catal. Today*, **81**,159-170.

Bettahar, M.M.; G. Costentin, L. Savary, J.C. Lavalley, (1996) “On the partial oxidation of propane and propylene on mixed oxide catalysts” *Appl. Catal. A: General* **145**, 1-48.

Bhattacharyya, D. ; Bej. S.K. ; Rao, M.S. (1992) « Oxidative Dehydrogenation of n-butane to butadiene. « Effect of Different Promoters on the Performance of vanadium-Magnesium Oxide catalysts ». *Appl. Catal.* **87**, 29 - 43

Blanco, C.; N. Reinoso; (2000) “Deshidrogenación oxidativa de n-butano sobre un catalizador VMgO/SiO₂”. Trabajo Especial de Grado. Universidad Central de Venezuela

Blasco, T., Concepción, P., López Nieto, J.M., Martínez-Arias, A. (1998) “Oxidative Dehydrogenation of Ethane on Vanadium-Containing Aluminophosphates with AFI Structure”. *Collection Czech. Chemical Communications* **63** 1869-1883.

Blasco, T., Dejoz, A., López Nieto, J.M., Marquez, F., Vázquez, M.I., (1998) “Deshidrogenación Oxidativa de n-Butano sobre Catalizadores VO_x/MgO promovidos por Óxidos Metales de Transición”. Simposio Iberoamericano de Catálisis, Córdoba-Argentina, pp. 897-902.

Blasco, T., Galli, A., López Nieto, y Trifiró, F., (1997a) “Oxidative Dehydrogenation of Ethane and n-Butane on VO_x/Al₂O₃ Catalysts”. *J Catal*, **169**, 203-211.

Blasco, T., López Nieto, J.M. (1996). “Nuclear Magnetic resonance studies on supported vanadium oxide catalysts”.. *Colloid Surf A*, **115**, 187-193

Blasco, T., López Nieto, J.M., (1997b) “Oxidative Dehydrogenation of Short Chain Alkanes on Supported Vanadium Oxide Catalysts”. *Applied. Catalysis. A*, **157**, 117-142.

Blasco, T., López Nieto, J.M., Dejoz, A., Vázquez, M.I., (1995) “Influence of the Acid-Base Character of Supported Vanadium Catalyst on their Catalytic Properties for the Oxidative Dehydrogenation of n-Butane”. *Journal of Catalysis* **157**, 271-282.

Botella, P., López Nieto, J.M., Solsona, B., Mifsud, A., Márquez, F. (2002).”The preparation, characterization and catalytic behavior of MoVTeNb mixed oxides catalysts prepared by hydrothermal synthesis”.. *Journal of Catalysis*. **209**, 445-455.

Botella, P., Solsona, B., Martínez-Arias A., López Nieto, J.M. (2001). “Selective oxidation of propane to acrylic acid on MoVNbTe mixed oxides catalysts prepared by hydrothermal synthesis”. *Catalysis Letters*, **74**, 149-154

Botella, P.; J.M. López Nieto, A. Dejoz, M.I. Vázquez, A. Martínez-Arias, (2003) “Mo-V-Nb mixed oxide as catalyst in the selective oxidation of ethane”. *Catalysis. Today* **78**,507-512

Bottino, A.; G. Capannelli, A. Comite, S. Storace, R. Di Felice, (2003) “Kinetic investigations on the oxidative hydrogenation of propane over vanadium supported on γ -Al₂O₃.” Chem. Eng. J., **94**, 11 – 18.

Boudeville, Y; M. Kolb, Max; A. Pantazidis, C. Marquez-Alvarez, Cl. Mirodatos, V. Elokhin,. (1999) “Monte-Carlo methods for simulating the catalytic oxidative dehydrogenation of propane over VMgO catalyst”. Chem. Eng. Sci. **54**, 4295 - 4304

Boutry , P.; Daumas, J.C.; Montarnal, R.; (1967). “Mechanism of dehydrogenative oxidation of paraffins”. Comptes Rendus des Seances de l'Academie des Sciences, Serie C: Sciences Chimiques **264**, 81-83.

Boutry, P.,; Coury, P.; Daumas, J.C.; Montarnal, R.:(1968) “Oxidation Déshydrogénante du n-butane sur Molibdate de Cobalt”. Bull. Soc. Chim. France **10**, 4050 - 4056

Burch, R. Tsang, S.C. y col.; (1990) “Investigation of the partial oxidation of hydrocarbons on methane coupling catalysts” Applied. Catalysis. **65**, 259-280.

Campbell, K. D.; Morales, E.; Lunsford, J. H. (1987). “Gas-phase coupling of methyl radicals during the catalytic partial oxidation of methane”. Journal of the American Chemical Society, **109**(25), 7900-1.

Carrazan, S. R. G.; Peres, C., Ruwet, M., Ruiz, P., Delmon, B. (1997). “Solid state reaction in Mg-V-O-Sb catalysts”. Solid State Ionics **101**, 737-739.

Carrazan, S.R.G.; C. Peres, J.P. Bernard, M. Ruwest, P. Ruiz, B. Delmon, (1996) “Catalytic Synergy in the oxidative Dehydrogenation of Propane over MgVO catalysts”. J. Catal. **158**, 452 - 476.

Cavani, F.; Trifiro, F; (1994) “Selective Oxidation of C₄ Paraffins” Catalysis, vol. **11** (ca.7), Royal Society of Chemistry, Cambridge. 246-317

Cavani, F., Ferruccio, T. (1994b) “Catalyzing Butane Oxidation to make Maleic Anhydride”. CHEMTECH **24**(4), 18-25.

Cavani, F.; F. Trifiró, (1995) “The oxidative Dehydrogenation of Ethane and propane as an Alternative Way for the Production of Light Olefins” Catal. Today, **24**, 307-313

Cavani, F., Trifiró, F. (1995b) “Alternative processes for the production of styrene”. Applied Catalysis A, **133**, 219-239.

Centi, G. (1993a). “Selective heterogeneous oxidation of light alkanes. What differentiates alkane from alkene feedstocks”. Catalysis Letters **22**, 53-66.

Centi, G.; Trifiró, F., Ebner, J.R., Franchetti, V.M. (1988). “Mechanistic Aspects of Maleic Anhydride Synthesis from C₄ Hydrocarbons over Phosphorous Vanadium Oxide”. Chemical Review **88**, 55-80.

Centi, G. y colb.; (1989) “Selective oxidation of n-pentane on 12-molybdovanadophosphoric acids” Appl. Catal. **46**, 197 – 212.

- Centi, G.**, Perathoner S., Trifiró, F. (1991). "Surface structure and reactivity of vanadium oxide species at the catalyst-support interface". Research on Chemical Intermediates **5**, 49-63.
- Centi, G.**, (1993b) "Vanadyl Pyrophosphate – A Critical Overview." Catalysis. Today, **16**, 5-26.
- Chaar, M.A.**, Patel, D., Kung, M., Kung, H.H. (1987). "Selective oxidative dehydrogenation of n-butane over V-Mg-O catalysts". Journal of Catalysis., **105**, 483-498.
- Chaar, M.A.**, Patel, D., Kung, M., Kung, H.H. (1988). "Oxidative dehydrogenation of propane over V-Mg-O catalysts". Journal of Catalysis., **109**, 463.
- Chen, K.**; Xie, S. Bell, A.T. Iglesia, E. (2000). "Structure and properties of zirconia-supported molybdenum oxide catalysts for oxidative dehydrogenation of propane". Journal of Catalysis. **189**(2), 421-430
- Chen, K.**; S. Xie, A.T. Bell, E. Iglesia, (2000a) " Structure and Properties of Oxidative Dehydrogenation Catalysts Based on MoO₃/Al₂O₃" Journal of Catalysis. **198**, 232 – 242.
- Chen, K.**; Xie, S. Bell, A.T. Iglesia, E. (2000b). "Kinetic Isotope effects in Oxidative dehydrogenation of propane on vanadium oxide catalysts". Journal of Catalysis **192**, 197-203.
- Chen, K.**, Iglesia, E., Bell, A.T. (2001a) "Kinetics and Mechanism of Oxidative Dehydrogenation of Propane on Vanadium, Molybdenum, and Tungsten Oxides". Journal of Physical Chemistry B, **104**(6), 1292-1299.
- Chen, K.**, Iglesia, E., Bell, A.T. (2001b). "Isotopic Tracer Studies of Reaction Pathways for Propane Oxidative Dehydrogenation on Molybdenum Oxide". Catalysts J. Phys. Chem. B, **105**, 646-653.
- Comite, A.**; A. Sorrentino, G. Capannelli, M. Di Serio, R. Tesser, E. Santacesaria, J. (2003) "Oxidative dehydrogenation of propane using V₂O₅/TiO₂/SiO₂ catalysts prepared by grafting titanium and vanadium alkoxides on silica" J. Molec. Catal. **198**, 151-165
- Concepción, P.**, López Nieto, J.M., Pérez-Pariente, J. (1993). "The selective oxidative dehydrogenation of propane on vanadium aluminophosphate catalysts". Catalysis Letters **19**, 333-337.
- Concepción, P.**; Dejoz, A.; Lopez Nieto, J.M.; Vásquez, M.I.; (1994) "Naturaleza de los Centros Activos para la deshidrogenación Oxidativa de Alcanos C2-C4. Proceeding of the XIVt Ibero-American Symposium en Catálisis. Sociedad Chilena de Química, Vol. **2**, 769-774
- Concepción P.**, López Nieto, J.M., Pérez Pariente J., (1995) "Oxidate Dehydrogenation of Propane on VAPO-5, V₂O₅/ALPO₄-5 and V₂O₅/MgO Catalysts. Nature of Selective Sites." J. Molec. Catal. A: General **99**, 173-182.

Concepción, P., Galli, A., López Nieto, J.M., Dejoz, Vázquez, M.I., (1996) “On the Influence of the Acid-Base Character of Catalysts on the Oxidative Dehydrogenation of Alkanes”. Topics in Catalysis, **3**, 451-460.

Concepción P., López Nieto, J.M. (2001). “Novel synthesis of a vanadium-cobalt aluminophosphate molecular sieve of AEI structure (VCoAPO-18) and its catalytic behaviour for the ethane oxidation”. Catalysis Communications **2**, 363-367.

Conway, S. J., Wang, D. J., Lunsford, J. H. (1991). “Selective oxidation of methane and ethane over lithium(1+)-magnesia-chloride catalysts promoted with metal oxides”. Applied Catalysis, A: General **79(1)**, L1-L5.

Corma, A., López Nieto, J.M., Paredes, N., Pérez, M., Shen, Y., Cao, H., Suib, S.L., (1992) “Oxidative Dehydrogenation of Propane over Supported Vanadium Oxide Catalysts”. Studies in Surface Science and Catalysis, **72**, 213-220.

Corma, A., López Nieto, J.M. and Paredes N., (1993a) “Preparations of V-Mg-O Catalysts: Nature of Active Species Precursors”. Appl. Catal. A: General, **104**, 161-174.

Corma, A., López Nieto, J.M. and Paredes N., (1993b) “Oxidative Dehydrogenation of Propane on Vanadium Supported on Magnesium Silicates”. Appl. Catal. A: General **97**, 159-175.

Corma, A. López Nieto, J.M. and Paredes N., (1993c) “Influence of the Preparation Methods of V-Mg-O Catalysts on their Catalytic Properties for the Oxidative Dehydrogenation of Propane”. J. Catal., **144**, 144-425.

Corma A., López Nieto J. M., Paredes N., Dejoz A. and Vázquez M. I., (1994a). “Oxidative Dehydrogenation of Propane and n-Butane on V-Mg Based Catalysts”, Stud.Surf. Sci. Catal., **82**, 113

Corma, A., López Nieto, J.M., Paredes, N., Dejoz, A. and Vázquez I., (1994b) “Oxidative Dehydrogenation of Propane and n-Butane on V-Mg Based Catalysts”. New Development in Selective Oxidation II, 113-123.

Corma, A. (1995). “Inorganic Solid Acids and Their Use in Acid-Catalyzed Hydrocarbon Reactions”. Chemical Review **95**, 559-614.

Creaser, D.; B. Andersson, (1996) “Oxidative dehydrogenation of propane over V-Mg-O; Kinetic investigation by nonlinear regression analysis”. Appl. Catal., A: General, **141**, 131-152

Dejoz, A. (1995) “Deshidrogenación Oxidativa de n-Butano sobre Catalizadores de Oxido de Vanadio Soportado”. Tesis Doctoral. Universidad de Valencia. España.

Dejoz, A., López Nieto, J.M., Melo, F. and Vázques, M.I., (1997) “Kinetic Study of the Oxidation of n-Butane on Vanadium Oxide Supported on Al/Mg Mixed Oxide”. Industrial and Engineering Chemistry Research, **36**, 2588-2596.

- Dejor, A.**, López Nieto, J.M., Márquez, F., Vázquez, M.I., (1999) “The Role of Molybdenum in Mo-Doped V-Mg-O Catalysts during the Oxidative Dehydrogenation of n-Butano”. Appl. Catal. A, **180**, 83-94.
- Deo, G.;** I.E. Wachs, J. Haber, Crit. Rev. Surf. Chem. **4** (1994) 141.
- Dickason, A.F** (1975) “Oxidative dehydrogenation of butane”. Patente USA 3.914.331.
- Eastman, A.D.** y colb.; U S Pat. 4,497,971 (1985)
- Galli A.**, López Nieto J. M., Dejor A. And Vázquez M. I., “The effect of Potassium on the Selective Oxidation of n-Butane and Ethane over Al₂O₃-Supported Vanadia Catalysts”. Catalysis. Letters, **34**, 51 (1995).
- Gao X. Xin Q.** and Guo X., (1994a) “Support effect on magnesium-vanadium mixed oxides in the oxidative dehydrogenation of propane”, Appl. Catal. A. Gen. **114**, 197
- Gao, X.**, Ruíz, P., Xin, Q., Guo, X. and Delmon, B., (1994b) “Effect of Coexistence of Magnesium Vanadate Phase in the Selective Oxidation of Propane to Propene”. Journal of Catalysis., **148**, 56-67.
- Gopal, R.**, Calvo, C. (1974). “Crystal structure of Magnesium Divanadate, Mg₂V₂O₇”. Acta Crystallografica B30, 2491-2493.
- Grabowski, R.;** Samson, K. (2003). “Potassium effects on kinetics of propane oxydehydrogenation on vanadia-titania catalyst”. Polish Journal of Chemistry, **77(4)**, 459-470.
- Grasselli, R.K.** (1999) “Advances and future trends in selective oxidation and ammoxidation catalysts”. Catalysis Today **49**, 141-153.
- Grasselli, R.K.** (2001). “Genesis of site isolation and phase cooperation in selective oxidation catalysis”. Topics Catalysis **15**, 93-102.
- Grasselli, R.K.;** Burrington, J.D. Buttrey, D.J. DeSanto, P. Lugmair, C.G. Volpe, A.F. Weingard, T. (2003). “Multifunctionality of the active centers in (amm)oxidation of propane: from Bi-Mo-O to Mo-V-Nb-(Te or Sb)-O catalysts”. Topics Catal. **23**, 5-22.
- Grzybowska-Swierkosza, B.;** (2002) “Effect of Additives on the Physicochemical and catalytic properties of oxide catalysts in Oxidatin Reactions” Topics Catal. **21**, 35 – 46
- Hann, Y.-F.;** Wang, H.-M., Cheng, H., Deng, J.-F. (1999). “V-Zr-P oxide catalysts for highly selective oxidation of propane to acrylic acid”. Chemical Communication 521-522.
- Hanuza, J.**, Jezowska-Trzebiatowska, B., Oganowski, W. (1985).”Structure of the active layer and catalytic mechanism of the vanadium pentoxide/magnesium catalysts in the oxidative dehydrogenation of ethylbenzene to styrene”. Journal of Molecular Catalysis **29(1)**, 109-43.

Hodnett, B.K. (1985). "Vanadium-phosphorus oxide catalysts for the selective oxidation of C4 hydrocarbons to maleic anhydride". Catalysis Review-Chemical engineering **27**, 373-424.

Kirk, R.E.; F. Orthmer, J.I. Kroschwitz and M. Howe-Grant, Kirk-Othmer's Encyclopedia of Chemical Technology; John Wiley & Sons, New York, 1991.

Krishnamachari y Calvo, (1971). "Refinement of the structure of $Mg_3(VO_2)_2$ ". Canadian Journal Chemistry, **49**, 1629-1637.

Kung, H.H.; (1986) "Transition Metal Oxides: Surface Chemistry and Catalysis" Ind. Eng. Chem. Prod. Res. Dev. **25**, 171

Kung, H.H., Chaar, M.A. (1988) US Patent, 4 772 319, 1998.

Kung, H.H., Chaar, M.A. (1988). "Oxidative Dehydrogenation of Alkanes to Unsaturated Hydrocarbons" US Patent, 4,772,319, October 11

Kung, H. H., (1994) "Oxidative Dehydrogenation of Light (C2 to C4) Alkanes", Advances of Catalysis. **40**, 1-38

Kung, H.H.; M.C. Kung, (1997) "Oxidative dehydrogenation of alkanes over vanadium-magnesium-oxides. Appl. Catal. A, **157**, 105-116

Le Bars, J.; Vedrine, J.C.; Auroux, A.; (1992) (a) "Role of surface acidity on vanadia/silica catalysts used in the oxidative dehydrogenation of ethane. Applied Catalysis. **88**, 179 - 195

Le Bars y col., "Proceedings of the DGMK" Goslar (Alemania), pag 59 (1992) (b)

Lemonidou, A. A. (2001) "Oxidative dehydrogenation of C4 hydrocarbons over VMgO catalyst-kinetic investigations. Appl. Catal. A: General **216**, 277-284

Lemonidou, A. A.; Nalbandian, L.; Vasalos, I. A. (2000). "Oxidative dehydrogenation of propane over vanadium oxide based catalysts Effect of support and alkali promoter".. Catalysis Today **61**(1-4), 333-341. C

Lin, M.M.; (2001) " Selective oxidation of propane to acrylic acid with molecular oxygen". Appl. Catal. A: General **207**, 1-16

Linke, D.; D. Wolf, M. Baerns, O. Timpe, R. Schogl, S. Zeyß, U. Dingerdisen, (2002) "Catalytic Partial Oxidation of Ethane to Acetic Acid over $Mo_1V_{0,25}Nb_{0,12}Pd_{0,0005}O_x$. I. Catalyst performance and Reaction Mechanism J. Catal. **205**, 16 - 1

López Nieto, J.M., Kremenic', G., Fierro, J.L.G. (1990). "Selective oxidation of propene over supported vanadium oxide catalysts". Applied Catalysis **61**, 235-251.

López Nieto, J.M., Dejoz, A., Vásquez, M.I., (1995) "Preparation, Characterization and Catalytic Properties of Vanadium Oxides Supported on Calcined Mg/Al-Hydrotalcite". Appl. Catal. A, **132**, 41-59.

- López Nieto, J.M.**, Coenraads R., Dejoz, A., Vázquez, M.I., (1997) “The Role of Metal Oxides as Promoters of $V_2O_5/\gamma-Al_2O_3$ Catalysts in the Oxidative Dehydrogenation of Propane”. Studies in Surface Science and Catalysis, **110**, 443-452.
- López Nieto, J.M.**, Dejoz, A., Vázquez, M.I., O’Leary, W., Cunningham, J. (1998) “Oxidative Dehydrogenation of n-Butane on MgO-Supported Vanadium Oxide Catalysts”. Applied Catalysis A, **40**, 215-228.
- López Nieto, J.M.**; J. Soler, P. Concepción, J. Herguido, M. Menéndez, J. Santamaría, (1999) “Oxidative Dehydrogenation of Alkanes over V-based catalysts: Influence of Redox Properties on Catalytic Performance” J. Catal. **185** 324 -332
- López Nieto, J.M.**; P. Concepción, A. Dejoz, H. Knözinger, F. Melo, M.I. Vázquez (2000a) “Selective oxidation of n-butane and butanes over Vanadium-Containing catalysts” J. Catal., **189**, 147-157.
- López Nieto, J.M.**; P. Concepción, A. Dejoz, F. Melo, H. Knözinger, M.I. Vázquez, (2000b) “Oxidative dehydrogenation of n-butane and 1-butene on undoped and K-doped VO_x/Al_2O_3 catalysts” Catal. Today **61** 361-367
- López Nieto J.M.** (2001). “Microporous and mesoporous materials with isolated Vanadium species as selective catalysts in the gas phase oxidation reactions”. Topics in Catalysis **15**, 189-194.
- López Nieto, J.M.**, Botella, P., Vázquez, M.I., Dejoz, A. (2002). “The Selective Oxidative Dehydrogenation of Ethane over Hydrothermally Synthesised MoVTenb”. Catalysts Chemical Communication, 1906-1907.
- López Nieto, J.M.**, Botella, P., Concepción, P., Dejoz, A., Vázquez, M.I., (2004). “Oxidative dehydrogenation of ethane on Te-containing MoVNbO catalysts”. Catalysis Today, en prensa.
- Madeira, L. M.**; M. F. Portela, C. Mazzocchia, A. Kaddouri, R. Anouchinsky, (1998a) “Reducibility of undoped and C8-Doped $\alpha-NiMoO_4$ Catalytic: Kinetic Effects in the Oxidative Dehydrogenation of n-butane”. Catalysis Today, **40**, 229 -293.
- Madeira, L. M.**; M. F. Portela, (1998b) « Kinetics and Mechanism of the Selective Oxidation and Degradation of n-butane over Nickel Molybdate Catalysts. In Natural gas Conversion V ». Studies in Surface Science and Catalysis, **119**, 611-616.
- Madeira, L. M.**; Portela, M. F.; Mazzocchia, C. (2004) “Nickel Molybdate Catalysts and Their Use in the Selective Oxidation of Hydrocarbons”. Catalysis Reviews - Science and Engineering, **46(1)**, 53-110.
- Mamedov, E.A.**, Cortés Coberán, V., (1995) “Oxidative Dehydrogenation of Lower Alkanes on Vanadium Oxide-Based Catalysts. The present state of the Art and Outlooks.” Appl. Catal. A, **127**-140.
- McCain, J. H.** (1985). “Oxydehydrogenation of ethane to ethylene”. Patente USA, 6 pp.

- McKetta, John** (1978) Enciclopedia of Chemical Processing and Design. Vol. **14** U.S.A. Marcel Dekker
- Melo, F.,** López Nieto, J.M., Vivancos, J.L., Dejoz, A., Vázquez, M.I., (1998) “Estudio Comparativo de la Deshidrogenación Oxidativa de n-Butano y Butenos sobre Catalizadores basados en Oxido de Vanadio Soportado”. Simposio de Cartagena, 869-874.
- Merzouki, M.;** Taouk, B. Monceaux, L. Bordes, E. Courtine, P. (1992). “Catalytic Properties of promoted vanadium oxide in the oxidation of ethane to acetic acid”. Studies Surface Science Catalysis **72**, 165-172.
- Michalakos, P.M.,** Kung, M.C., Jahan, I. and Kung, H.H., (1993) “Selectivity Patterns in Alkane Oxidation over $Mg_3(VO_4)_2-MgO$, $Mg_2V_2O_7$ and $(VO)_2P_2O_7$ ”. Journal of Catalysis, **140**, 226-242.
- Morales, E.;** Lunsford, Jack H. (1989). “Oxidative dehydrogenation of ethane over a lithium-promoted magnesium oxide catalyst”. Journal of Catalysis, **118(1)**, 255-65.
- Mori; Miyamoto, A.;** Murakami, Y.; (1983) “Structure sensitivity in the oxidations of butane, 1-butene, butadiene, and furan on V_2O_5 catalysts” Appl. Catal., **6**, 209
- Ng, H.N.,** Calvo, C. (1972) “Crystal structure of an electron spin resonance of Mn^{2+} in MgV_2O_6 ”. Canadian Journal of Chemistry **50**, 3619-3624.
- Nicolescu, I.V.;** Sandulescu, I.; An. Univ. Bucarest; Chim. **20**, 31 (1971)
- Owen, O.S.;** Kung, M.C.; Kung, H.H. (1992) “The effect of oxide Structure and cation Reduction Potencial of Vanadates on the Selective Oxidative Dehydrogenation of Butane and Propane” Catal. Lett. **12**, 45-50.
- Owen, O.S.;** Kung, H.H (1993) “Effect of cation Reducibility on Oxidative Dehydrogenation of Butane o Orthovanadates” J. Molec. Catal. **79**, 265-284
- Papa J.** (1968) “M3D. Manual del Usuario,” Escuela de Ingeniería Química. Facultad de Ingeniería. Universidad Central de Venezuela. Caracas, Venezuela
- Pless, J.D.;** B. Bardin, H. Kim, D. Ko, M.T. Smith, R.R. Hammond, P.C. Stair, K.R. Poepelmeier, (2004) “Catalytic oxidative dehydrogenation of propane over Mg-V/Mo oxides” J.Catal., **223**, 419-431.
- Ramos, R.;** Pina, M.P., Menendez, M., Santamaria, J., Patience, G.S. (2001). “Oxidative dehydrogenation of propane to propene.1. Kinetic study on V/MgO”. Canadian Journal Chemical Engineering, **79** 891-901.
- Rizayev, R. G.;** Talyshinskii, R. M.; Seifullayeva, J. M.; Guseinova, E. M.; Panteleyeva, Yu. A.; Mamedov, E. A. (1994) “Oxidative dehydrogenation of the C4-C5 paraffins over vanadium-containing oxide catalysts”. Studies in Surface Science and Catalysis, **82**, 125-32.
- Romero, L. C. y colb.,** Rev. Latinom. Ing. Qum. Quim. Apl. **14**, 193 (1984)

Rubio, O.; Herguido, J.; Menendez, M., (2003) “Oxidative dehydrogenation of n-butane on V/MgO catalyst-kinetic study in anaerobic conditions”. Chem. Eng. Sci. **58**, 4619-4627

Ruth, K.; R. Kieffer, R. Burch, (1998) “Mo-V-Nb Oxide catalysts for the Partial Oxidation of Ethane I. Preparation and Structural Characterisation” Journal of Catalysis. **175**, 16.-26

Siew Hew Sam, D.; Soenen, V. and Volta, J.C., (1990). “Oxidative Dehydrogenation of Propane over V-Mg-O Catalysts”. Journal of Catalysis., **123**, 417-435.

Singh, D.; Gehlawat, J.K., Rao, M.S. (1990) “Studies on oxidative dehydrogenation of n-butane on bismuth molybdate on alumina”. Journal of Chemical Technology and Biotechnology **47(2)**, 127-36.

Sitnikov, V. G.; Andrushkevich, M. M.; Buyanov, R. A.; Plyasova, L. M.; Babenko, V. S.; Kustova, G. N.; Klimik, I. N. (1974) “Phase composition and catalytic activity of the cobalt(II) oxide-molybdenum trioxide system in the oxidative and oxygen free dehydrogenation of butane and n-butylene”. Kinetika i Kataliz, **15(4)**, 943-8.

Soler, J.; Herguido, J., Menéndez, M., Santamaría, J., López Nieto, J.M., (1998) “Catalizadores de Vanadio Soportados para la Deshidrogenación Oxidativa de n-Butano en Reactor Redox de Lecho Fluidizado”. Simposio Iberoamericano de Catálisis, Cartagena-Colombia, pp. 881-886.

Soler, J.; López Nieto, J.M., Herguido, J., Menéndez, M., Santamaría, J., (1998a) “Oxidative Dehydrogenation of n-Butane on V/MgO Catalysts. Influence of the Type of Contactor”. Catalysis Letter, **50**, 25-50.

Soler, J.; López Nieto, J.M., Herguido, J., Menéndez, M., Santamaría, J., (1999) “Oxidative Dehydrogenation of n-Butane in a Two-Zone Fluidized-Bed Reactor”. Industrial and Engineering Chemistry Research, **38**, 90-97.

Solsona, B. T.; Blasco, J.M. López Nieto, M.L. Peña, F. Rey and A. Vidal-Moya, (2001) “Vanadium Oxide Supported on Mesoporous MCM-41 as Selective Catalysts in the Oxidative Dehydrogenation of Alkanes” Journal of Catalysis., **20**, 443 - 452

Solsona, B.; V.A. Zazhigalov, J.M. López Nieto, I.V. Bacherikova, E.A. Diyuk, (2003) “Oxidative dehydrogenation of ethane on promoted VPO catalysts”. Appl. Catal. A: General, **249**, 81-92.

Stepanov, G.A.; Tsailingld, A.L., Levin, V.A., Pilipenko, F.S., (1981) “The Catalytic Activity of Binary Oxide Systems in the Reaction of n-Butane Oxidative Dehydrogenation”. Studies in Surface Science and Catalysis, **78**, 1293-1303.

Tellez, C.; Menéndez, M., Santamaría, J., (1998) “Comparación de Diversos Catalizadores de Oxidos Mixtos en Reactores de Membrana de Pared Porosa en la Deshidrogenación Oxidativa de Butano”. Simposio de Cartagena, 977-982.

Téllez, C.; M. Menendez, J. Santamaria, (1999) “Kinetic Study of the Oxidative Dehydrogenation of butane on V/Mg Catalysts”. Journal of Catalysis, 183 210.

Thorsteinson, E.M., Wilson, T.P., Young, F.G., Kasai, P.H. (1978). "The Oxidative dehydrogenation of ethane over catalyst containing Mixed Oxides of Molybdenum and Vanadium". Journal of Catalysis **52**, 116-132.

Tolstoy, V.P.; Tolstobrov, E.V., Solid. State Ionics **151** (2002) 165.

Ueda, W.; Asakawa, K.; Chen, Ch.; Moro-oka, Y.; Ikawa, T. (1986). "Catalytic properties of tricomponent metal oxides having the scheelite structure. I. Role of bulk diffusion of lattice oxide ions in the oxidation of propylene". Journal of Catalysis, **101(2)**, 360-8.

Ueda, W., Lee, K.H., Yoon, Y.S. and Moro-oka, Y., (1998) "Selective Oxidative Dehydrogenation of Propane over Surface Molybdenum-enriched MgMoO₄ Catalyst". Catal. Today **44**, 199-203.

Ushikubo, T.; Oshima, K.; Umezawa, T.; Kiyono, K. (1992) "Process for producing nitriles" Patente Europea EP 512846 .

Ushikubo, T., (2003) "Activation of propane and butanes over niobium- and tantalum-based oxide catalysts". Catalysis. Today, **78**, 79-84

Van Den Bleek K., Van der Wiele P. J. and Van Den Berg, (1968). "The effect of dilution on the degree of conversion in fixed bed catalytic reactors",.

Vedrine, J.C., Coudurier, G. and Millet, J-M. M. (1997), "Molecular Design of Active Sites in Partial Oxidation Reactions on Metallic Oxides". Catalysis. Today, **33**, 3

Venckhuysen, B.M.; D.E. Keller, (2003) "Chemistry, spectroscopy and the role of supported vanadium oxides in heterogeneous catalysis". Catal. Today **78**, 25-46.

Vidal-Michel, R.; K.L. Hohn, (2004) "Effect of crystal size on the oxidative dehydrogenation of butane on V/MgO catalysts" J. Catal. **221**, 127-136.

Vislovskiy, V. P.; N.T. Shamilov, A.M. Sardarly, R.M. Talyshinskii, V. Yu. Bychkov, P. Ruiz, V. Cortes Corberan, Z. Schay, Z. Koppány, Appl. Catal. A: General **250** (2003) 143.

Vrieland, G.E., Khazai, B., Murchison, C.B., (1996b) "Anaerobic Oxidation of Butane to Butadiene over Magnesium Molybdate Catalysts. II. Magnesia Alumina Supported Catalysts", Applied. Catalysis A: General, **134**, 123-145.

Wachs, I.E.; Y. Chen, J.-M. Jeng, L.E. Briand, T. Tanaka, (2003). "Molecular structure and reactivity of the Group V metal oxides". Catalysis Today, **78**, 13-23

Wang, Ch. B.; G. Deo, I.E.; J.Catal. **178** (1998) 640

Zanthoff, H. W., Jalibert, J.C., Schuurman, Y., Slama, P. Herrmann, J.M., Mirodatos, C. (2000). "Dynamics of the oxidative dehydrogenation of propane over VMgO catalysts studied by in situ electrical conductivity and step transients". Studies Surface Science Catalysis, **130A** 761-766.

Zatorski, L.W.; Centi, G., Lopez Nieto, J.M., Trifiro', F., Bellusi, G., Fattore, V. (1989). "On the properties of pure and isomorphically-substituted zeolites in the presence of gaseous oxygen: selective transformation of propane". Studies Surface Science Catalysis **49**, 1243-1252.