



UNIVERSIDAD DE GUADALAJARA

H. CONSEJO GENERAL UNIVERSITARIO

EJECUCIÓN No. M/01/2010/123/1

Dr. Víctor González Álvarez
Rector del Centro Universitario
de Ciencias Exactas e Ingenierías
Universidad de Guadalajara
Presente

En cumplimiento a lo establecido por el artículo 35, fracción II, y 42, fracción I, de la Ley Orgánica de la Universidad de Guadalajara, adjunto al presente nos permitimos remitir a sus finas atenciones, para su ejecución, el dictamen emitido por las Comisiones Permanentes Conjuntas de Educación y de Hacienda del H. Consejo General Universitario, aprobado en sesión extraordinaria efectuada el 26 de Enero de 2010:

Dictamen número I/2010/036: Se aprobó la propuesta de otorgar el título de "Doctor Honoris Causa" de la Universidad de Guadalajara, al Dr. Mario Molina Henríquez.

Lo anterior, para los efectos legales a que haya lugar.

Atentamente
"PIENSA Y TRABAJA"

"2010 Bicentenario de la Independencia y Centenario de la Revolución Mexicana"
Guadalajara, Jal.; 27 de Enero de 2010

Dr. Marco Antonio Cortés Guardado
Rector General

Lic. José Alfredo Peña Ramos
Secretario General

c.c.p. Dr. Miguel Ángel Navarro Navarro, Vicerector Ejecutivo.
c.c.p. Mtro. Gustavo A. Cárdenas Cullího, Coordinador de Finanzas.
c.c.p. Dr. Héctor Raúl Salís Gadea, Coordinador General Académico
c.c.p. Mtra. Sonia Blesño Montes de Oca, Coordinadora General de Recursos Humanos.
c.c.p. Lic. Roberto Rivas Montiel, Coordinador de Control Escolar.
c.c.p. Minutario
JAPR/JAH/Roy



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P R E S E N T E

A estas Comisiones Conjuntas de Educación y Hacienda han sido turnados los dictámenes 5606/2008 y CONS-CUCE/CE/020/2009, de fechas 23 de Junio de 2008 y 03 de Diciembre de 2009, en los que los Consejos de los Centros Universitarios de Ciencias de la Salud y Ciencias Exactas e Ingenierías proponen que se otorgue al Dr. Mario Molina Henríquez el título de "Doctor Honoris Causa" de esta máxima Casa de Estudios, y

Resultando:

- 1) Que el Dr. Mario Molina es nativo de la ciudad de México en donde nació en 1943, se graduó como Ingeniero Químico en la Universidad Nacional Autónoma de México; posteriormente, hizo un posgrado en Cinética de Polímeros en la Universidad de Friburgo, Alemania y un doctorado en Fisicoquímica en la Universidad de California, Berkeley.
- 2) Que el Dr. Mario Molina fue profesor en el Instituto Tecnológico de Massachusetts en el periodo 1989-2004; profesor e investigador de la Universidad Nacional Autónoma de México entre 1967 y 1968; de la Universidad de Irvine, California, entre 1975 y 1979 y del Laboratorio de Propulsión a Chorro del Instituto Tecnológico de California (CALTECH) en el periodo de 1982 a 1989.
- 3) Que el Dr. Molina es un pionero de la química de la capa de ozono de la estratosfera; fue coautor de la publicación, en 1974, en la revista británica Nature, del artículo original que predijo el adelgazamiento de la capa de ozono como consecuencia de la emisión de ciertos gases industriales- los clorofluorocarburos (CFCs)- que estaban siendo usados como refrigerantes, solventes, propelentes, etc. Sus investigaciones condujeron al Protocolo de Montreal de las Naciones Unidas, un tratado que prohíbe la producción de CFCs en los países desarrollados desde 1996. Este es el primer tratado internacional que ha prácticamente resuelto un problema ambiental a escala global.
- 4) Que conjuntamente, el Dr. Molina y su grupo de investigación publicaron una serie de artículos, entre 1976 y 1986, identificando las propiedades químicas de compuestos que juegan un papel esencial en la descomposición del ozono de la estratosfera. Subsecuentemente, demostraron en el laboratorio la existencia de una nueva clase de reacciones químicas que ocurren en la superficie de partículas de hielo, incluyendo aquellas que están presentes en la atmósfera.



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- 5) Que igualmente, propusieron y demostraron en el laboratorio una nueva secuencia de reacciones catalíticas que explican la mayor parte de la destrucción del ozono en la estratosfera polar. Recientemente, el Profesor Molina ha estado investigando la química de la contaminación atmosférica en la baja atmósfera. También está involucrado en trabajos Interdisciplinarios, colaborando con expertos en múltiples disciplinas para enfrentar el problema de la degradación de la calidad del aire en las grandes ciudades del planeta.
- 6) Que el Dr. Mario Molina es miembro de la Academia Nacional de Ciencias y del Instituto de Medicina de los Estados Unidos, de la Pontificia Academia de las Ciencias del Vaticano, de la Academia Mexicana de Ciencias, la Academia Mexicana de Ingeniería, miembro del Colegio Nacional y de otras instituciones que a continuación se mencionan:
- Miembro en Sociedades Profesionales;
 - American Chemical Society;
 - American Physical Society;
 - American Geophysical Union;
 - Sigma Xi Scientific Research Society; y
 - Society for the Advancement of Chicano and Native American Scientists.
- 7) Que el Dr. Mario Molina ha sido distinguido con numerosos galardones por sus trabajos, incluyendo más de 18 doctorados Honoris Causa, además de:
- UCI Alumni Association Special Recognition for Contributions in Basic Research, 1976;
 - Newport Democratic Club Public Service Award for Service to the Environment, 1977;
 - Alfred P. Sloan Foundation Fellow, 1976-1978;
 - Camille and Henry Dreyfus Teacher-Scholar, 1978-1982;
 - Tyler Ecology and Energy Prize, 1983;
 - Society of Hispanic Professional Engineers Award for Achievement in Science and Technology, 1983;
 - Council for Recognition of Hispanics, Science Honoree, 1984;
 - American Chemical Society Esselen Award, 1987;
 - American Association for the Advancement of Science Newcomb-Cleveland Prize, 1978-1988;
 - NASA Medal for Exceptional Scientific Achievement, 1989;
 - United Nations Environment Programme Global 500 Award, 1989;
 - Orange County Section of the American Chemical Society Service Through Chemistry Award, 1989;
 - Pew Scholar on Conservation and the Environment, 1990-1992;
 - Member, National Academy of Sciences, 1993 presente;
 - Miembro, Academia Mexicana de Ingeniería, 1994 presente;
 - Max Planck Research Award, 1994-1996;
 - Nobel Prize in Chemistry, 1995;
 - United Nations Environment Programme Ozone Award, 1995;
 - Doctor Honoris Causa, Universidad de Buenos Aires, Argentina, 1996;
 - Walker Prize, Boston Museum of Science, 1996;

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- UCI Committee on Undergraduate Scholarships, Honors and Financial Awards UCI Academic Senate, 1980-1981;
- NCAR Scientific Programs Evaluation Committee, Panel Review of Atmospheric Chemistry Division, Boulder, CO, 1986;
- UCR Ad Hoc Committee for Review of the Statewide Air Pollution Research Center, Riverside, CA, 1988;
- NASA Advisory Committee to Oversee the Scientific Assessment of Atmospheric Effects Associated with Stratospheric Emissions from High Speed Civil Transports, 1988- 1994;
- Editorial Advisory Board of the International Journal of Chemical Kinetics, 1988-1991;
- DOE Review Panel for the Molecular Science Research Center at the Pacific Northwest Laboratories, Batelle, Richland, WA, 1988;
- NOAA Review Panel for the Aeronomy Laboratory (Chair), 1989;
- NSF Advisory Committee for Atmospheric Sciences, 1989-1994;
- NRC-NAS Steering Committee on Aeronautical Technologies, 1990-1993;
- NRC-NAS Committee on Atmospheric Chemistry, 1991-1993;
- NSF Advisory Committee for Geosciences, 1994-1997;
- Presidents's Committee of Advisors on Science and Technology (PCAST), 1994-2000;
- Advisory Panel of Atmospheric Chemistry Division, National Center for Atmospheric Research, 1995 presente;
- Member, MIT International Council, 1996-2000;
- Member, MIT Council on the Environment, 1996 presente;
- Member, MIT Task Force on Student Life and Learning, 1996-2000;
- Member, Editorial Advisory Board of Accounts of Chemical Research, 1996-2000;
- Member, Board of Directors, Northeast State Clean Air Foundation, 1996 presente;
- Advisor to the Camille and Henry Dreyfus Foundation (Environ. Program), 1996-2002;
- Chair, Advisory Board, United Nations Environment Programme Regional, Office for North America (UNEP/RONA), 1996 presente;
- Member, Board of Governors, US_Mexico Foundation for Science, 1996 presente;
- Member, Board of Directors, Union of Concerned Scientists, 1997 presente;
- Member, Steering Committee, MIT consortium on Global Environmental Challenges, 1997-2001;
- Member, the Presidents's Committee on the National Medal of Science 1997-2000;
- Member, National Research Council Board on Environmental Studies and Toxicology, 1997-2000;
- Member, Secretary of Energy Advisory Board, 1998-2002;
- Member, Advisory Editorial Board, Chemical Physics Letters, 1999 presente;
- Member, Board of Trustees, Science Service, 2000 presente;
- Member, Visiting Committee, Max Planck Institute for Chemistry, 2000 presente;
- Member, National Research Council Board on Atmospheric Sciences and Climate, 2001 presente;
- Member, College of Chemistry Advisory Board, University of California, Berkeley, 2001 presente;
- Member, Advisory Board, Journal of Physical Chemistry 2002, 2002;
- Member, National Commission on Energy Policy, 2002;
- Chair, Scientific Advisory Council, Comisión Federal para la Protección Contra Riesgos Sanitarios, México, 2002;

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- Member, Board of Directors, The John D. and Catherine T. MacArthur Foundations, 2002.
- 9) Que a lo largo de su trayectoria profesional, el Dr. Mario Molina ha tenido las siguientes actividades profesionales selectas:
- Testified by invitation at hearings before the House of Representatives Subcommittee on Public Health & Environment of the Committee on Interstate and Foreign Commerce, 93rd Congress; the U.S. Senate Subcommittee on Toxic Substances and Environmental Oversight of the Committee on Environment and Public Works; and before numerous state legislatures on the issue of chlorofluorocarbons and stratospheric ozone depletion, 1974;
 - NASA Panel for Chemical Kinetics and Photochemical Data Evaluation, 1978 presente;
 - TRW/NASA Consultant, Halogen Occultation Experiment (HALOE) Langley Research Center, 1979-1981;
 - Co-chair, 14th Informal Conference on Photochemistry, Newport Beach, CA, 1980;
 - NRC/NAS Panelist, Postdoctoral Fellowships Program, 1982-1987;
 - Organizer and Presider, Symposium on Antarctic Ozone Depletion AAAS Annual Meeting, Boston, MA, 1988;
 - Organizer and Presider, Symposium on Physical Chemical Problems in the Earth's Atmosphere, 196th American Chemical Society National Meeting, Los Angeles, CA, 1988;
 - Panelist, Annual Meeting of the National Academy of Sciences President's Circle on Issues Confronting the Global Future, Irvine, CA, 1989;
 - Co-organizer and lecturer, Atmospheric Chemistry Workshop Universidad Nacional Autónoma de México, Mexico City, Mexico, 1991;
 - Co-chair, Gordon Conference on Atmospheric Chemistry, New Hampton, NH, 1991;
 - Co-chair, Atmospheric Chemistry Colloquium for emerging Senior Scientists, MIT, Cambridge, MA, 1991;
 - Sigma Xi National Lecturer, 1992-1993;
 - Robert A. Welch foundation Lecturer, 1994;
 - Evaluation Committee for Chemistry Graduate Programs at the National Universidad Nacional Autónoma de México, Mexico City, Mexico, 1995;
 - Member of the Jury, King Jaime I Prize on the Defense of Nature, Valencia, Spain, 1996 presente;
 - Participant, Intel International Science and Engineering Fair, 1997;
 - Co-organizer, Symposium on "Atmospheric Chemistry; from Local to Global Pollution," Fifth Chemical Congress of North America, Cancun, Mexico, 1997;
 - Panelist, White House Roundtable on Global Climate Change (Washington, DC), 1997;
 - Chair, Committee on Atmospheric Chemistry, National Academy of Sciences, 1999-presente;
 - Chair, World Bank Blue Ribbon Panel on Mexico City Air Quality Management, 1999-2001;
 - Co-chair, PCAST Independent Review Board of the National Assessment on Climate Change, 1999-2000;



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- Co-chair, Secretary of Energy Advisory Board Panel on Emerging Technological Alternatives to Incineration, 2000;
- Chair, Environmental Sciences Review Committee, Brookhaven National Laboratory, 2002;
- Co-chair, Workshop on the Environment, Challenges for the Chemical Sciences in the 21st Century, National Academy of Sciences, 2002.

10] Que el Dr. Mario Molina ha participado en la siguientes conferencias científicas:

- Stratospheric chemistry of chlorine compounds. In Proceedings of the Joint Symposium on Atmospheric Ozone. (IAOCC/ICACGP, Dresden, German Democratic Republic), 1976;
- Stratospheric chemistry chlorofluorocarbons. In Abstracts of the Symposium on Fluorine Compounds in the Environment (Amer. Chem. Soc. 172 nd Nat. Meeting, San Francisco), 1976;
- Atmospheric Chemistry of Chlorofluorocarbons. In Proceedings of the XV International Congress of Entomology: Simposium on "The Impact of the CFC/Ozone Question on Insecticidal Aerosols", p. 399 (Academic Press, New Yor), 1977;
- Laboratory measurements of absorption cross sections. In Proceedings of NATO Advanced Study Institute on Atmospheric Ozone, October 1979. A. Alken, ed, (Report No. FAA-EE-80-29), p. 589, 1980;
- Kinetic of hidroxy radical reactions of interest in the stratosphere. In Abstracts of the 28th IUPAC Congress (Int. Union of Pure and Applied Chem., Vancouver, Canada), 1981;
- Laboratory chemistry and stratospheric ozone. In Proceedings of the Indo-US Workshop on Global Ozone Problem (New Delhi, India), 1983;
- Rates of reaction of OH with HNO₃ and with HCl. In Abstracts of the Amer. Chem. Soc. 185th National Meeting, Div. of Environmental Chemistry (Seattle, WA), 1983;
- Heterochemical studies on ice chemistry. In Report of the Fluorocarbon Program Panel Meeting, Chemical Manufacturer's Association (Edinburgh, Scotland), 1987;
- Ice chemistry and Antarctic ozona. In Abstracts of the Symposium on Heterogeneous Reactions in the Atmosphere, Pacific conference on Chemistry and spectroscopy (Irvine, CA);
- Heterogeneous chemical processes in ozone depletion. In Proceedings of the Sumposium on Ozone Depletion, Greenhouse Gases and Climate Change, Board on Atmospheric Sciences and Climate (National Academy of Sciences, Washington, DC), 1988;
- Chlorofluorocarbons in the environment: A Review. In Proceedings of the Sumposium on Environmental Fate of Organochlorine Compounds in the Atmosphere, 36 th ASMS Conference on Mass Spectroscopy and Allied Topics (ASMS, San Francisco, CA).
- The chemical mechanisms for ozone loss over Antarctica. In Abstracts of the Symposium on Current Trends in Atmospheric Sciences, International Congress of Geochemistry and Cosmochemistry (Paris, France).
- The chemistry of some reactions believed to be important in ozone depletion over Antarctica. In Proceedings of the International Ozone Symposium. T. Bojkov and P. Fabian, Eds. (Deepak, Hampton, VA), 1989;
- Global atmospheric chemistry of halogens. In Abstracts of the International Symposium on Global and Regional Environmental Atmospheric Chemistry (Beijing, China).
- Laboratory chemistry and stratospheric clouds. In Abstracts of the Symposium on the Role of Clouds in Atmospheric Chemistry and Global Climate (Am. Met.-Soc., Anaheim, CA).

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- Heterogeneous chemistry in the Antarctic stratosphere. In Abstracts of the Symposium on Fundamental Kinetic Processes Linking CFC Release to Global Ozone Destruction in the Polar Stratosphere (Am. Chem. Soc., Dallas, TX).
- Heterogeneous chemistry on polar stratospheric clouds. In Abstracts of the Symposium on the Climate Effects on Aerosols (Am. Assoc. For Aerosol Res., Reno, NV).
- Stratospheric ozone: Current Concerns. In Abstracts of the Global Environmental Chemistry - Challenges and Initiatives (Am. Chem. Soc., Miami, FL).
- Chemistry of Antarctic ozone depletion. In Abstracts of the 3rd Intl. Conference on Southern Hemisphere Meteorology and Oceanography (Am. Met. Soc., Buenos Aires, Argentina).
- Chemistry of Polar Ozone Depletion. In Abstracts of the Twentieth International Symposium on Free Radicals (Shizuoka, Japan), 1990;
- Heterogeneous Chemical Processes. In Abstracts of the American Chemical Society 200th National Meeting, Division of Physical Chemistry (Washington, DC).
- Chemistry of Stratospheric Ozone Depletion. In Abstracts of the 12th International Symposium on Gas Kinetic (Reading, UK), 1992;
- An Overview of Polar Ozone Depletion. In Science at the Frontier 2, National Academy of Sciences/National Research Council (Irvine, California).
- Stratospheric Ozone. In Abstracts of the Scheele Symp. On Oxygen (Stockholm, Sweden).
- Stratosphere Ozone Depletion. In Abstracts of the Atmospheric Chemistry Symposium of the 1993 Pittsburh Conference on Analytical Chemistry (Atlanta, GA), 1993;
- The role of Photochemistry in Stratospheric Ozone Depletion. In Abstracts of the XVI the International Conference on Photochemistry (Vancouver, Canada).
- Chemical Mechanisms of Atmospheric Ozone Depletion. 7th BOC Priestly Conference (Lewisberg, PA), 1994;
- HCl vapor pressures and reaction probabilities for ClONO₂ + HCl on liquid H₂SO₄-HNO₃-HCl-H₂O solutions. Faraday Discussions on Atmospheric chemistry (Norwich, UK), 1995;
- Monitoring the Ozone Hole. Conference on The Habitability of the Earth, Princeton University's 250th Anniversary Celebration (Princeton, NJ), 1996;
- Stratospheric Ozone Depletion: A Global Problem, The Third Annual William Nordberg Memorial Lecture, Goddard Space Flight Center (Greenbelt, MD).
- The Chemistry of Polar Ozone Depletion. Cornell University (Ithaca, NY).
- Heterogeneous Reactions. A New Perspective in Atmospheric Chemistry. CIBA Foundation/Royal Society Discussion Meeting on Atmospheric Chemistry and Global Change (London, UK).
- Chemistry of Ice Particles. Ida Beam distinguished Visiting Professor Lecture Series, University of Iowa (Iowa City, Iowa), 1997;
- Chemical Kinetic Studies of Atmospheric Reactions, Creative Advances in Envir. Sci. & Tech. Award Symposium at the 213th National ACS meeting (San Francisco, CA).
- Global Change Research: Cooperation in the Americas, Special Symposium on Science Policy and Scientific, Cooperation in the Americas, Fifth Chemical Congress of North America (Cancun, Mexico).
- The Chemistry of Ice Clouds, Canon Visiting Scholar, The college of William and Mary (Williamsburg, Virginia), 1998;

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- A Perspective on Stratospheric Ozone Depletion, Plenary Lecture, 1999 Annual Meeting of the American Academy of Dermatology (New Orleans, LA), 1999;
- The Impact of Human Activities on Atmospheric Ozone, Shirley A. Kliegel Lectureship in Geological and Planetary Sciences, California Institute of Technology (Pasadena, CA).
- Physical Chemistry of Atmospheric Inorganic Aerosol: Solids or Liquids? Chancellor's Science Seminar Series, University of North Carolina (Chapel Hill, NC).
- The Role of the Evaluation of Kinetics and Photochemical Data in the Ozone Depletion Issue, American Geophysical Union Spring Meeting (Boston, Ma).
- Global Atmospheric Pollution: Ozone Depletion and Climate Change, A Century of Nobel Prizes: Science and Humanism, UNESCO/Interdisciplinary University of Paris (Paris, France).
- Global Atmospheric Chemistry: Challenges for the Coming Decade, 1999 Distinguished Guest Lecture, Royal Society Chemistry (London, UK).
- An overview of the Chemistry of Atmosphere Particulates in the Stratosphere and Troposphere, 2000;
- NARSTO 2000 Symposium on Tropospheric Aerosols (Querétaro, Mexico).
- Global Change and the Antarctic Ozone Hole, Jubilee Plenary Session on Science and the Future of Mankind, Pontifical Academy of Sciences (Vatican).
- Urban, Regional and Global Air Pollution, Keynote Address, 12 th World Clean Air and Environment Congress (Seoul, Korea), 2001;
- Environmental Impact of Energy, Energy Day, British Chamber of Commerce (Mexico City, Mexico).
- Surface Chemistry of Atmospheric Aerosols, the 11 th Annual George C. Pimentel Memorial Lecture, University of California, Berkeley (Berkeley, California), 2002;
- Surface Chemistry of Atmospheric Aerosols, American Chemical Society 224 th National Meeting (Boston, MA).
- Atmospheric Chemistry and Flow Reactors, and Surface chemistry of Atmospheric Aerosols, Kaufman Lectures, University of Pittsburgh (Pittsburgh, PA).
- The Antarctic Ozone Hole, Chemical Engineering Graduate Students, Association Symposium, Carnegie Mellon University (Pittsburgh, PA).
- El Impacto de las Actividades Humanas en la Atmósfera, Keynote Address, XXVIII Congreso de Ingeniería Sanitaria y Ambiental (Cancún, México).
- The Impact of human activities on the Chemistry of the atmosphere 28th International Union of Geodesy and Geophysics, General Assembly (Sapporo, Japan).



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11) Que dentro de las publicaciones del Dr. Mario Molina se encuentran:

- Molina, M.J. and G.C. Pimentel, Tandem chemical laser measurements of vibrational energy distribution in the dichloroethylene photoelimination reactions. *J. Chem. Phys.*, 56, 3988, 1972;
- Molina, M.J. and G.C. Pimentel, Chemical laser studies of vibrational energy distributions: The equal-gain and zero-gain temperature techniques. *IEEE J. Quantum Electronics*, QE-9, 64, 1973;
- Molina, M.J. and F.S. Rowland, Stratospheric sink for chlorofluoromethanes-chlorine atom catalyzed destruction of ozone. *Nature*, 249, 810, 1974;
- Molina, M.J. and F.S. Rowland, Predicted present stratospheric abundances of chlorine species from photodissociation of carbon tetrachloride. *Geophys. Res. Lett.*, 1, 309, 1974;
- Molina, M.J. and F.S. Rowland, Chlorofluoromethanes in the environment. *Rev. Geophys. and Space Phys.*, 13, 1, 1975;
- Rowland, F.S. and M.J. Molina, Some unmeasured chlorine atom reaction rates important for stratospheric modeling of chlorine atom catalyzed removal of ozone. *J. Phys. Chem.*, 79, 667, 1975;
- Rowland, F.S. and M.J. Molina, The ozone question. *Science*, 190, 1038, 1975;
- Rowland, F.S., M.J. Molina, and C.C. Chou, Natural halocarbons in air and sea. *Nature*, 258, 775, 1975;
- Rowland, F.S. and M.J. Molina, Estimated future atmospheric concentrations of CCl₃F (fluorocarbon-11) for various hypothetical tropospheric removal rates. *J. Phys. Chem.*, 80, 2049, 1976;
- Rowland, F.S., J.E. Spencer, and M.J. Molina, Stratospheric formation and photolysis of chlorine nitrate, ClONO₂. *J. Phys. Chem.*, 80, 2711, 1976;
- Rowland, F.S., J.E. Spencer, and M.J. Molina, Estimated stratospheric concentrations of chlorine nitrate, ClONO₂. *J. Phys. Chem.*, 80, 2713, 1976;
- Chou, C.C., W.S. Smith, H. Vera Ruiz, K. Moe, G. Crescentini, M.J. Molina, and F.S. Rowland, The temperature dependence of the ultraviolet absorption cross-sections of CCl₂F₂ and CCl₃F, and their stratospheric significance. *J. Phys. Chem.*, 81, 286, 1977;
- Molina, L.T., J.E. Spencer, and M.J. Molina, The rate constant for the reaction of O (3P) atoms with ClONO₂. *Chem. Phys. Lett.*, 45, 158-162, 1977;
- Molina, L.T. and M.J. Molina, Ultraviolet absorption spectrum of chlorine nitrite, ClONO. *Geophys. Res. Lett.*, 4, 8386, 1977;
- Graham, R.A., E.C. Tuazon, A.M. Winer, J.N. Pitts, L.T. Molina, L. Beaman, and M.J. Molina, High resolution infrared absorptivities for gaseous chlorine nitrate. *Geophys. Res. Lett.*, 4, 3-5, 1977;
- Molina, L.T., S.D. Schinke, and M.J. Molina, Ultraviolet absorption spectrum of hydrogen peroxide vapor. *Geophys. Res. Lett.*, 4, 580-582, 1977;
- Murcray, D.G. A. Goldman, W.J. Williams, F.H. Murcray, F.S. Bonomo, C.M. Bradford, G.R. Cook, P.L. Hanst, and M.J. Molina, Upper limit for stratospheric ClONO₂ from balloon borne infrared measurements. *Geophys. Res. Lett.*, 4, 227-230, 1977;
- Miziolek, A.W. and M.J. Molina, The rate constant for the reaction of oxygen (O3P) atoms with dichlorine monoxide. *J. Phys. Chem.*, 82, 1769-1771, 1978;



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- Chou, C.C. R.J. Milstein, W.S. Smith, H. Vera Ruiz, M.J. Molina, and F.S. Rowland, Stratospheric photodissociation of several saturated perhalo-chlorofluorocarbon compounds of current technological use. (Fluorocarbons - 13, 113, 114, 115). *J. Phys. Chem.*, 82, 1-7, 1978;
- Molina, L.T. and M.J. Molina, The ultraviolet spectrum of HOCl. *J. Phys. Chem.*, 82, 2410-2414, 1978;
- Molina, L.T. and M.J. Molina, Chlorine nitrate ultraviolet absorption spectrum at stratospheric temperatures. *J. Photochemistry*, 11, 139-144, 1979;
- Molina, M.J. and G. Arguello, Ultraviolet absorption spectrum of methylhydroperoxide. *Geophys. Res. Lett.*, 6, 953-955, 1979. Molina, M.J., T. Ishiwata and L.T. Molina, Production of OH from photolysis of HOCl at 307-309 nm. *J. Phys. Chem.*, 84, 821-826, 1980;
- Molina, M.J., L.T. Molina and T. Ishiwata, Kinetics of the $\text{ClO} + \text{NO}_2 + \text{M}$ reaction. *J. Phys. Chem.*, 84, 3100-3104, 1980;
- Molina, L.T. and M.J. Molina, UV absorption cross sections of HO₂NO₂ vapor. *J. Photochem.*, 15, 97-108, 1981;
- Molina, M.J., L.T. Molina, and J.J. Lamb, Temperature dependent UV absorption cross sections of carbonyl sulfide. *Geophys. Res. Lett.*, 8, 1008-1011, 1981;
- Molina, L.T., M.J. Molina, and F.S. Rowland, Ultraviolet absorption cross sections of several n brominated methanes and ethanes of atmospheric interest. *J. Phys. Chem.*, 86, 2672, 1982;
- Molina, L.T. and M.J. Molina, Quantum yields for photodissociation of CBr₂F₂ in the 200-300 nm region. *J. Phys. Chem.*, 87, 1306-1308, 1983;
- Lamb, J.J., L.T. Molina, C.A. Smith, and M.J. Molina, Rate constant of the $\text{OH} + \text{H}_2\text{O}_2 \rightarrow \text{HO}_2 + \text{H}_2\text{O}$ reaction. *J. Phys. Chem.*, 87, 4467-4470, 1983;
- Smith, C.A., L.T. Molina, J.J. Lamb, and M.J. Molina, Kinetics of the reaction of OH with pernitric and with nitric acids. *Inter. J. Chem. Kinetics*, 16, 41-55, 1984;
- Molina, M.J., L.T. Molina, and C.A. Smith, The rate of the reaction of OH with HCl. *Inter. J. Chem. Kinetics*, 16, 1151-1160, 1984;
- Molina, L.T., M.J. Molina, R.A. Stachnik, and R.D. Tom, An upper limit to the rate of the $\text{HCl} + \text{ClONO}_2$ reaction. *J. Phys. Chem.*, 89, 3779-3781, 1985;
- Molina, L.T. and M.J. Molina, Absolute absorption cross sections of ozone in the 185 to 350 nm wavelength range. *J. Geophys. Res.*, 91, 14501-14508, 1986;
- Stachnik, R.A., L.T. Molina, and M.J. Molina, Pressure and temperature dependences of the reaction of OH with nitric acid. *J. Phys. Chem.*, 90, 2777-2780, 1986;
- Molina, L.T. and M.J. Molina, Production of the Cl_2O_2 from the self-reaction of the ClO radical. *J. Phys. Chem.*, 91, 433-436, 1987;
- Stachnik, R.A. and M.J. Molina, Kinetics of the reactions of SH radicals with NO₂ and O₂. *J. Phys. Chem.*, 91, 4603-4606, 1987;
- Molina, M.J., T.L. Tso, L.T. Molina and F.C.-Y. Wang, Antarctic stratospheric chemistry of chlorine nitrate, hydrogen chloride, and ice: Release of active chlorine. *Science*, 238, 1253-1257, 1987;
- Wolf, S.C., M.J. Molina, R. J. Salawitch, L.E. Fox, and M.B. McElroy, Interactions between HCl, NO_x, and H₂O ice in the Antarctic stratosphere: implications for ozone. *J. Geophys. Res.*, 93, 2442-2450, 1988;
- Molina, M.J., The Antarctic ozone hole. *Oceanus*, 31, 47-52, 1988;



UNIVERSIDAD DE GUADALAJARA

H. CONSEJO GENERAL UNIVERSITARIO

Exp. 021

Dictamen Núm. I/2010/036

- Molina, M.J., The chemistry of some reactions believed to be important in ozone depletion over Antarctica. In *Ozone in the Atmosphere*, ed. by R.D. Bojkov and P. Fabian, pp 61-64. Deepak, Hampton, VA, 1989;
- Molina, M.J., A.J. Colussi, L.T. Molina, R.N. Schindler, and T.L. Tso, Quantum yield of chlorine-atom formation in the photodissociation of chlorine peroxide (ClOOCl) at 308 nm. *Chem. Phys. Lett.*, 173, 310-315, 1990;
- Molina, M.J., Heterogeneous chemistry on polar stratospheric clouds. *Atm. Environment*, 25A, 2535-2537, 1991;
- Molina, M.J., Chemistry of stratospheric ozone depletion. In *Atmospheric Chemistry: models and predictions for climate and air quality*, C.S. Sloane and T.W. Tesche, eds., 1-8. Lewis Publishers, MI., 1991;
- Abbatt, J.P.D. and M.J. Molina, The heterogeneous reaction $\text{HOCl} + \text{HCl} \rightleftharpoons \text{Cl}_2 + \text{H}_2\text{O}$ on ice and nitric acid trihydrate: Reaction probabilities and stratospheric implications. *Geophys. Res. Lett.*, 19, 461-464, 1992;
- Abbatt, J.P.D. and M.J. Molina, Heterogeneous interaction of ClONO₂ and HCl on nitric acid trihydrate at 202K. *J. Phys. Chem.*, 96, 7674-7679, 1992;
- Molina, M.J. and L.T. Molina, Stratospheric Ozone. In *The Science of Global Change: The Impact of Human Activities on the Environment*, D.A. Dunnette and R.J. O'Brien, eds., 24-35. American Chemical Society, Washington, DC., 1992;
- Abbatt, J.P.D., K.D. Beyer, A.F. Fucaloro, J.R. McMahon, P.J. Wooldridge, R. Zhang, and M.J. Molina, Interactions of HCl vapor with water-ice: Implications for the stratosphere. *J. Geophys. Res.*, 97, 15819-15826, 1992;
- Zhang, R., P.J. Wooldridge, and M.J. Molina, Vapor pressure measurements for the H₂SO₄/HNO₃/H₂O and H₂SO₄/HCl/H₂O systems: Incorporation of stratospheric acids into background sulfate aerosols. *J. Phys. Chem.*, 97, 8541-8548, 1993;
- Seeley, J.V., J.T. Jayne, and M.J. Molina, High pressure fast-flow technique for gas phase kinetics studies. *Int. J. Chem. Kinetics*, 25, 571-594, 1993;
- Zhang, R., P.J. Wooldridge, J.P.D. Abbatt, and M.J. Molina, Physical chemistry of the H₂SO₄/H₂O binary system at low temperatures: Stratospheric implications. *J. Phys. Chem.*, 97, 7351-7358, 1993;
- Abbatt, J.P.D. and M.J. Molina, Status of stratospheric ozone depletion. *Ann. Rev. of Energy & Environment*, 18, 1-29, 1993;
- Molina, M.J., R. Zhang, P.J. Wooldridge, J.R. McMahon, J.E. Kim, H.Y. Chang, and K.D. Beyer, Physical chemistry of the H₂SO₄/HNO₃/H₂O system: Implications for polar stratospheric clouds. *Science*, 261, 1418-1423, 1993;
- Molina, M.J., Chemical interactions of tropospheric halogens on snow/ice. In *The Tropospheric Chemistry of Ozone in the Polar Regions*, N. Niki and K.H. Becker, eds. NATO ASI Series I: Global Environmental Change, Vol. 7, pp 273-279. Springer-Verlag, 1993;
- Zhang, R., J.T. Jayne, and M.J. Molina, Heterogeneous interactions of ClONO₂ and HCl with sulfuric acid tetrahydrate: Implications for the stratosphere. *J. Phys. Chem.*, 98, 867-874, 1994;
- Molina, M.J., Science and Policy Interface. In *Business & the Contemporary World* 6(2), 125-128, 1994;
- Molina, M.J., The probable role of stratospheric 'ice' clouds: Heterogeneous chemistry of the 'Ozone Hole' In *The Chemistry of the Atmosphere: Its Impact on Global Change*, J.G. Calvert, ed., 27-38. Blackwell, Oxford, U.K, 1994;

Página 11 de 19



UNIVERSIDAD DE GUADALAJARA

H. CONSEJO GENERAL UNIVERSITARIO

Exp. 021

Dictamen Núm. V/2010/036

- Beyer, K.D., S.W. Seago, H.Y. Chang, and M.J. Molina, Composition and freezing of aqueous H₂SO₄/HNO₃ solutions under polar stratospheric conditions. *Geophys. Res. Lett.*, 21, 871-874, 1994;
- Kolb, C.E., J.T. Jayne, D.R. Worsnop, M.J. Molina, R.F. Meads, and A.A. Viggiano, Gas phase reaction of sulfur trioxide with water vapor. *J. Am. Chem. Soc.*, 116, 10314-10315, 1994;
- Rowland, F.S. and M.J. Molina, Ozone depletion: 20 years after the alarm. *Chem. and Engr. News*, 72, 8, 1994;
- Molina, M.J. Chemical mechanism of atmospheric ozone depletion. In *The Chemistry of the Atmosphere, Oxidants and Oxidation in the Earth's Atmosphere*. A.R. Bandy, ed., 83-87. The Royal Society of Chemistry, UK, 1995;
- Shen, T.-L., P.J. Wooldridge and M.J. Molina, Stratospheric pollution and ozone depletion. In *Composition, Chemistry and Climate of the Atmosphere*, H.B. Singh, ed., 394-442. Van Nostrand Reinhold, 1995;
- Wooldridge, P. J., R. Zhang, and M.J. Molina, Phase equilibria of H₂SO₄, HNO₃, and HCl hydrates and the composition of polar stratospheric clouds. *J. Geophys. Res.*, 100, 1389-1396, 1995;
- Molina, L.T., P.J. Wooldridge, and M.J. Molina, Atmospheric reactions and ultraviolet and infrared absorptivities of nitrogen trifluoride. *Geophys. Res. Lett.*, 22, 1873-1876, 1995;
- Emanuel, P. J., K. Speer, R. Rotunno, R. Sivastava, and M.J. Molina, Hypercanes: A possible link in global extinction scenarios. *J. Geophys. Res.*, 100, 13755-13765, 1995;
- Elrod, P. J., R.E. Koch, J.E. Kim, and M.J. Molina, HCl vapor pressures and reaction probabilities for ClONO₂ + HCl on liquid H₂SO₄-HNO₃-HCl-H₂O solutions. *Faraday Discuss.*, 100, 269-278, 1995;
- Molina, L.T. and M.J. Molina, Ultraviolet spectrum of CF₃OH: Upper limits to the absorption cross sections. *Geophys. Res. Lett.*, 23, 563-565, 1996;
- Seeley, J.V., J.T. Jayne, and M.J. Molina, Kinetics studies of chlorine atom reactions using the turbulent flow tube technique. *J. Phys. Chem.*, 100, 4019-4025, 1996;
- Seeley, J.V., R.F. Meads, M.J. Elrod, and M.J. Molina, Temperature and pressure dependence of the rate constant for the HO₂ + NO reaction. *J. Phys. Chem.*, 100, 4026-4031, 1996;
- Elrod, M.J., R.F. Meads, J.B. Lipson, J.V. Seeley, and M.J. Molina, Temperature dependence of the rate constant for the HO₂ + BrO reaction. *J. Phys. Chem.*, 100, 5808-5812, 1996;
- Zhang, R., M.-T. Leu, and M.J. Molina, Formation of polar stratospheric clouds on preactivated background aerosols. *Geophys. Res. Lett.*, 23, 1669-1672, 1996;
- Molina, M.J., L.T. Molina, and D.M. Golden, Environmental chemistry (gas and gas-solid interactions): The role of physical chemistry. *J. Phys. Chem.*, 100, 12888-12896, 1996;
- Molina, M.J., Role of chlorine in stratospheric chemistry, *Pure & Appl. Chem.*, 68, 1749-1756, 1996;
- Molina, M.J., Polar Ozone Depletion (Nobel Lecture), *Angew. Chem. Int. Ed. Engl.*, 35, 1778-1785, 1996;
- Molina, M.J., L.T. Molina, and C.E., Gas Phase and Heterogeneous Chemical Kinetics of the Troposphere and Stratosphere. *Ann. Rev. Phys. Chem.*, 47, 327-367, 1996;
- Castro, T., L.G. Ruiz-Suarez, J.C. Ruiz-Suarez, M.J. Molina, and M. Montero, Sensitivity analysis of a UV radiation transfer model and experimental photolysis rates of NO₂ in the atmosphere of Mexico City. *Atm. Environ.*, 31, 609-620, 1997;

Página 12 de 19



UNIVERSIDAD DE GUADALAJARA

H. CONSEJO GENERAL UNIVERSITARIO

Exp. 021
Dictamen Núm. I/2010/036

- Lipson, J.B., M.J. Elrod, T.W. Belderhase, L.T. Molina, and M.J. Molina, Temperature Dependence of the rate constant and branching ratio for the OH + ClO reaction. *J. Chem. Soc., Faraday Trans.*, 93, 2665-2773, 1997;
- Martin, S.T., D. Salcedo, L.T. Molina, and M.J. Molina, Phase transformation of micron-sized H₂SO₄/H₂O particles studied by infrared spectroscopy. *J. Phys. Chem.*, 101, 5307-5313, 1997;
- Molina, M.J., L.T. Molina, R. Zhang, R.F. Meads, and D.D. Spencer, The reaction of ClONO₂ with HCl on aluminum oxide, *Geophys. Res. Lett.*, 24, 1619-1622, 1997;
- Wallington, T.J., W.F. Schneider, J. Sehested, M. Bilde, J. Platz, O.J. Nielsen, L.K. Christensen, M.J. Molina, L.T. Molina, and P.W. Wooldridge, Atmospheric chemistry of HFE-7100 (C₄F₉OCH₃): Reaction with OH radicals, UV spectra and kinetic data for C₄F₉OCH₂ and C₄F₉OCH₂O₂ radicals, and the atmospheric fate of C₄F₉OCH₂ radicals, *J. Phys. Chem.*, 101, 8264-8274, 1997;
- Jayne, J.T., U. Poeschl, Y-M. Chen, D. Dai, L.T. Molina, D.R. Worsnop, C.E. Kolb, and M.J. Molina, Pressure and temperature dependence of the gas-phase reaction of SO₃ with H₂O and the heterogeneous reaction of SO₃ with H₂O/H₂SO₄ surfaces, *J. Phys. Chem.*, 101, 10,000-10,011, 1997;
- Percival, C.J., G.D. Smith, L.T. Molina, and M.J. Molina, Temperature and pressure dependence of the rate constant for the ClO and NO₂ reaction, *J. Phys. Chem.*, 101, 8830-8833, 1997;
- Martin, S.T., D. Salcedo, L.T. Molina, and M.J. Molina, Deliquescence of sulfuric acid tetrahydrate following volcanic eruptions or denitrification, *Geophys. Res. Lett.*, 25, 31-34, 1998;
- Christensen, L.K., J. Sehested, O.J. Nielsen, M. Bilde, T.J. Wallington, A. Guschin, L.T. Molina, and M.J. Molina, Atmospheric chemistry of HFE-7200(C₄H₉OC₂H₅): Reaction with OH radicals and fate of C₄F₉OCH₂CH₂O and C₄F₉OCHOCH₃ radicals, *J. Phys. Chem.*, 102, 4839-4845, 1998;
- Navarro-Gonzales, R., M.J. Molina, and L.T. Molina, Nitrogen fixation by volcanic lightning in the early Earth, *Geophys. Res. Lett.*, 25, 3123, 1998;
- Molina, M.J., The changing chemistry of the atmosphere: A challenge for the 21st Century, in *Chemical Research 2000 and Beyond: Challenges and Vision*, P. Barkin, ed., 11-21, American Chemical Society, 1998;
- Molina, M.J. and L.T. Molina, Chlorofluorocarbons and destruction of the ozone layer, in *Environmental and Occupational Medicine*, 3rd Edition, W.N. Rom, ed., 1639-1648, Lippincott-Raven, Philadelphia, 1998;
- Zhang, R., L.T. Molina, and M.J. Molina, Development of an electrostatic ion guide in chemical ionization mass spectrometry, *Rev. Sci. Instrum.*, 69, 4002-4003, 1998;
- Koop, T. H.P. Ng, L.T. Molina, and M.J. Molina, A new optical technique to study aerosol phase transitions: The nucleation of ice from H₂SO₄ aerosols, *J. Phys. Chem.*, 102, 8924-8931, 1998;
- Pöschl, U. M. Canaragatna, J.T. Jayne, L.T. Molina, D.R. Worsnop, C.E. Kolb, and M.J. Molina, Mass accommodation coefficient of H₂SO₄ vapor on aqueous sulfuric acid surfaces and gaseous diffusion coefficient of H₂SO₄ in N₂/H₂O, *J. Phys. Chem.*, 102, 10082-10089, 1998;
- Chang, H-Y. A., T. Koop, L.T. Molina, and M.J. Molina, Phase transitions in emulsified HNO₃/H₂O and HNO₃/H₂SO₄/H₂O solutions, *J. Phys. Chem.*, 103, 2673-2679, 1999;



UNIVERSIDAD DE GUADALAJARA

H. CONSEJO GENERAL UNIVERSITARIO

Exp. 021

Dictamen Núm. I/2010/036

- Lipson, J.B., T.W. Beldershe, L.T. Molina, and M.J. Molina, Production of the HCl in the OH+ClO Reaction: Laboratory measurements and statistical rate theory calculations, J. Phys. Chem. A, 103, 6540-6551, 1999;
- Molina, M.J., Abbau von stratosphärischem Ozon durch FCKW, Naturw. Rdsch, 52, 144-146, 1999.
- Molina, M.J., R. Zhang, K. Broekhuizen, W. Lei, R. Navarro and L.T. Molina, Experimental study of intermediates from OH-initiated reactions of toluene, J. Am. Chem. Soc., 121, 10225-10226, 1999.
- Lee, S.H., D.C. Leard, R. Zhang, L.T. Molina and M.J. Molina, The HCl + ClONO₂ reaction rate on various water ice surfaces, Chem. Phys. Lett., 315, 7-11, 1999.
- Koop, T., A.K. Bertram, L.T. Molina and M.J. Molina, Phase transitions in aqueous NH₄HSO₄ solutions, J. Phys. Chem., 103, 9042-9048, 1999.
- Molina, L.T., Molina, M.J., Report of the First Workshop on Mexico City Air Quality, February 16, 2000, Mexico City, MIT-IPURGAP Report No. 2, June 1999;
- Molina, L.T., Molina, M.J., Report of the Second Workshop on Mexico City Air Quality, January 24-25, 2000, MIT, Cambridge, MA, MIT-IPURGAP Report No. 3, May 2000;
- Molina, M.J., Molina, L.T., Sosa, G., Gasca, J., West, J., Análisis y Diagnóstico del inventario de Emisiones de la Zona Metropolitana del Valle de México. MIT-IPURGAP Report No. 5, 59 pages, August, 2000;
- Molina, L.T., Molina, M.J. Report of the Third Workshop on Mexico City Air Quality, June 12-13, 2000, Cuernavaca, Mexico. MIT-IPURGAP Report No. 6, September 2000;
- Molina, L.T., Molina, M.J., Estrategia Integral de Gestión de la Calidad del Aire en el Valle de México. MIT-IPURGAP Report No. 7, 126 pages, October 2000;
- Molina, L.T., Molina, M.J., West, J., San Martini, F., Sosa, G., Sheinbaum, C., Estado Actual del Conocimiento Científico de la Contaminación del Aire en el Valle de México. MIT-IPURGAP Report No. 9, 84 pages, October 2000;
- Aoki, C., Benbarka, A., Gakenheimer, R., Makler, J., Molina, L.T., Molina, M.J., Stott, R., Sussman, J., Zegras, C., Howitt, A., Lacy, R., Sanchez, S., Evaluación de los Sistemas de Transporte, MIT-IPURGAP Report No. 11, 138 pages, October 2000;
- Dodder, R., Connors, S., Gibbs, B., West, J., San Martini, F., Vijay, S., Molina, L.T., Molina, M.J., Evaluación Integral: Proyecto de la Ciudad de México. MIT-IPURGAP Report No. 13, 67 pages, October, 2000;
- Sosa, G., West, J., San Martini, F., Molina, L.T., Molina, M.J. Air Quality Modeling and Data Analysis for Ozone and Particulates in Mexico City, MIT-IPURGAP Report No. 15, 76 pages, October, 2000;
- Vijay, S., Connors, S., West, J., Molina, M.J., Non-Transportation Energy-Related Sources of Air Pollution in the MCMA: Emission Implications and Mitigation Options, MIT-IPURGAP Report No. 21, 28 pages, October 2000;
- Bertram, A.K., T. Koop, L.T. Molina and M.J. Molina, Ice formation in (NH₄)₂SO₄-H₂O particles, J. Phys. Chem., 104, 584-588, 2000;
- Ninomiya, Y., M. Kawaski, A. Guschin, L.T. Molina, M. J. Molina, and T. Wallington, J. Environ. Sci. Technol, 34, 2973, 2000. Salcedo, D., L.T. Molina, and M.-J. Molina, Nucleation rates of nitric acid dihydrate in 1:2 HNO₃/H₂O solutions at stratospheric temperatures, Geophys. Res. Lett., 27, 193-196, 2000;
- Smith, G. D., L.T. Molina and M. J. Molina, Temperature dependence of O(¹D) quantum yields from the photolysis of ozone between 295 and 338 nm, J. Phys. Chem. A, 104, 8916-8921, 2000;



UNIVERSIDAD DE GUADALAJARA

H. CONSEJO GENERAL UNIVERSITARIO

Exp. 021

Dictamen Núm. V/2010/036

- Koop, T., A. Kapilashrami, L. T. Molina, and M. J. Molina, Phase transitions of sea salt/water mixtures at low temperatures: Implications for ozone chemistry in the polar marine boundary layer, *J. Geophys. Res.*, 105, 26,393-26,402, 2000;
- Molina, M.J., L.T. Molina, T.B. Fitzpatrick and P.T. Nghiem, Ozone depletion and human health effects, in *Environmental Medicine*, Lennart Moller, ed., 28-51. Joint Industrial Safety Council Product 33, Sweden, 2000;
- Zhang, R., W. Lei, L.T. Molina, and M.J. Molina, Ion transmission and ion/molecule separation using an electrostatic ion guide in chemical ionization mass spectrometry, *Intl. J. Mass Spectrom.*, 194, 41-48, 2000;
- Mantz, Y. A., Geiger, F. M., Molina, L. T., Molina, M. J., and Trout, B. L., First principles theoretical study of molecular HCl adsorption on a hexagonal ice (0001) surface, *J. Chem. Phys.*, 113, 7037-7046, 2000;
- Mantz, Y. A., Geiger, F. M., Molina, L. T., Molina, M. J., and Trout, B. L., First principles molecular dynamics study of surface disordering of the (0001) face of hexagonal ice, *J. Chem. Phys.*, 113, 10733-10743, 2000;
- Molina, L.T., Molina, M.J., Report of the Fourth Workshop on Mexico City Air Quality, March 8-10, 2001, El Colegio de Mexico, MIT-IPURGAP Report No. 25, October, 2001;
- Salcedo, D., L.T. Molina and M.J. Molina, Homogeneous Freezing of Concentrated Aqueous Nitric Acid Solutions at Polar Stratospheric Temperatures, *J. Phys. Chem.*, 105, 1433, 2001;
- Navarro-Gonzales, R., M. Villagran-Muniz, H. Sobral, L.T. Molina and M.J. Molina, The physical mechanism of nitric oxide formation in simulated lightning, *Geophys. Res. Lett.*, 28, 3867-3870, 2001;
- Mantz, Y. A., Geiger, F. M., Molina, L. T., Molina, M. J., and Trout, B. L., The interaction of HCl with the (0001) face of hexagonal ice studied theoretically via Car-Parrinello molecular dynamics, *Chem. Phys. Lett.*, 348, 285-292, 2001;
- Bertram, A.K., A.V. Ivanov, M. Hunter, L.T. Molina and M.J. Molina, The reaction probability of OH on organic surfaces of tropospheric interest, *J. Phys. Chem.*, 105, 9415-0421, 2001;
- Smith, G.D., F.M.G. Tablas, L.T. Molina and M.J. Molina, Measurement of relative product yields from the photolysis of dichlorine monoxide (Cl₂O), *J. Phys. Chem.*, 105, 8658-8664, 2001;
- Zuberi, B., A.K. Bertram, T. Koop, L.T. Molina and M.J. Molina, Heterogeneous freezing of aqueous particles induced by crystallized (NH₄)₂SO₄, ice, and letovicite, *J. Phys. Chem.*, 105, 6458-6464, 2001;
- Lei, W. F., D. Zhang, R. Zhang, L.T. Molina and M.J. Molina, Rate constants and isomeric branching of the Cl-isoprene reaction, *Chem. Phys. Lett.*, 357, 45-50, 2002;
- Goto, M., Y. Inoue, M. Kawasaki, A. G. Guschin, L. T. Molina and M. J. Molina, T. J. Wallington and M. D. Hurley, Atmospheric Chemistry of HFE-7500 (n-C₃F₇CF(OC₂H₅)CF(CF₃)₂): Reaction with OH radicals and Cl atoms and Atmospheric Fate of n-C₃F₇CF(OCHO(•))CF(CF₃)₂ and n-C₃F₇CF(OCH₂CH₂O(•))CF(CF₃)₂ Radicals, *Environ. Sci. Technol.*, 36, 2395-2402, 2002;
- Zuberi, B., A. K. Bertram, C. A. Cassa, L. T. Molina, and M. J. Molina, Heterogeneous Nucleation of Ice In (NH₄)₂SO₄-H₂O Particles with Mineral Dust Immersions, *Geophys. Res. Lett.*, 29, 1421-1424, 2002;
- Smith, G.D., L.T. Molina and M.J. Molina, Measurement of radical quantum yields from formaldehyde photolysis between 269 and 339 nm, *J. Phys. Chem.*, 106, 1238-1240, 2002;



UNIVERSIDAD DE GUADALAJARA

H. CONSEJO GENERAL UNIVERSITARIO

Exp. 021

Dictamen Núm. I/2010/036

- Remorov, R.G., Yu. M. Gershenzon, L.T. Molina and M.J. Molina, Kinetics and Mechanism of HO₂ Uptake on Solid NaCl, *J. Phys. Chem.*, 106, 4558-4565, 2002;
- Lei, W.F., R.Y. Zhang, L.T. Molina and M.J. Molina, Theoretical study of chloroalkenylperoxy radicals, *J. Phys. Chem.*, 106, 6415-6420, 2002;
- Molina, L. T. and M.J. Molina, eds., *Air Quality in the Mexico Megacity: An Integrated Assessment*, 390 pp. Kluwer Academic Publishers, Dordrecht, 2002;
- Mantz, Y.A., F.M. Geiger, L.T. Molina, M.J. Molina and B.L. Trout, A theoretical study of the interaction of HCl with crystalline NAT, *J. Phys. Chem. A*, 106, 6972-6981, 2002;
- Suh, I., D. Zhang, R.Y. Zhang, L.T. Molina and M.J. Molina, Theoretical study of OH addition reaction to toluene, *Chem. Phys. Lett.*, 364, 454-462, 2002;
- Taniguchi N, T.J. Wallington, M.D. Hurley, A.G. Guschin, L.T. Molina and M.J. Molina, Atmospheric chemistry of C₂F₅C(O)CF(CF₃)₂: Photolysis and reaction with Cl atoms, OH radicals, and ozone, *J. Phys. Chem. A*, 107, 2674-2679, 2003;
- Bogdan A., M.J. Molina, M. Kulmala, A.R. Mackenzie and A. Laaksonen, Study of finely divided aqueous systems as an aid to understanding the formation mechanism of polar stratospheric clouds: Case of HNO₃/H₂O and H₂SO₄/H₂O systems, *J. Geophys. Res. Atm.*, 108, # 4302, 2003;
- Molina, M.J., *Aerosol Processes in the Stratosphere*. In *Handbook of Weather, Climate and Water*, T.D. Potter and B.R. Colman, eds., 405-414. Wiley Interscience, New Jersey, 2003;
- Molina, L.T., Molina, M.J. Report of the Workshop on Mexico Emissions Inventory, February 25-26, 2003. Mexico, D.F., Mexico, MIT-IPURGAP Report No. 31, May 2003;
- Molina, L.T., Molina, M.J. Report of the Sixth Workshop on Mexico City Air Quality, January 20-23, 2003, Mexico City, DF, Mexico, MIT-IPURGAP Report No. 37, August, 2003;
- Jiang, M., Marr L.C., Dunlea, E.J., Herndon, S.C., Jayne, J.T., Kolb, C.D., Knighton W.B., Rogers, T.M., Zavaia M, Molina L.T., Molina, M.J., Vehicle fleet emissions of black carbon, polycyclic aromatic hydrocarbons, and other pollutants measured by a mobile laboratory in Mexico City., *Atmos.Chem.Phys.*, 5, 3377-3387, 2005;
- Salcedo, D., Onash, T.B., Dzepina, K., Canagaratna, M.R., Zhang, A., Huffman, J.A., DeCarlo, P.F., Tayne, J.T., Morrimer, P., Worsnop D.R., Kolb, C.E., Johnson, K.S., Zuberi, B., Marr, L.C., Volkamer, R., Molina, L.T., Molina, M.J., Cárdenas, B, Bernabé, R.M., Márquez, C., Gaffney, J.S., Marley, N.A., Laskin, A, Shuttannandan, V., Xie, Y, Brune, W., Leshner, R., Shirley, T., Jimenez, J.L., Characterization for ambient aerosol in Mexico City during the MCMA-2003 campaign with Aerosol Mass Spectrometry: results from the CENICA SuperSite, *Atmos. Chem. Phys.*, 6, 925-946, 2006;
- De Foy, B., Clappier, S.; Molina, L.T., Molina, M.J., Distinct wind convergence patterns due to thermal and momentum forcing of the low level jet into the Mexico City Basin, *Atmos. Chem. Phys. Discuss.*, 5, 11055-11090, 2005;
- Barnard, J.C., Kassianov, E.I., Ackerman, Frey, S., Johnson, K., Zuberi, B., Molina, L.T., Molina, M.J., Gaffney, J.S., Marley, N.A., Measurements of Black Carbon Specific Absorption Area during the MCMA-2003 Field Campaign, *Atmos.Chem. Phys. Discuss.*, 5, 4083-4113, 2005;
- De Foy, B., Caetano, E., Magaña, V., Ztácuaró, A., Cárdenas, B., Retama, A., Ramos, R, Molina, L.T., Molina, M.J., Mexico City basin wind circulation during the MCMA-2003 field campaign, *Atmos. Chem. Phys. Discuss.*, 5, 2503-2558, 2005;
- De Foy, B., Caetano, E., Magaña, V., Ztácuaró, A., Cárdenas, B., Retama, A., Ramos, R., Molina, L.T., Molina, M.J., Mexico City basin wind circulation during the MCMA-2003 field campaign, *Atmos. Chem. Phys.*, 5, 2267-2288, 2005;

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UNIVERSIDAD DE GUADALAJARA

H. CONSEJO GENERAL UNIVERSITARIO

Exp. 021
Dictamen Núm. V/2010/036

- Johnson, K.S., Zuberi, B., Molina, L.T., Molina, M.J., Iedema, M.J., Cowin, J.P., Gaspar, D.J., Wang, C., Laskin, A., Processing of soot in an urban environment: case study from the Mexico City Metropolitan Area, *Atmos. Chem Phys.*, 5, 3033-3043, 2005;
- García, A.R., Volkamer, R., Molina, L.T., Molina, M.J., Samuelson, J., Mellqvist, J., Galle, B., Herndon, S.C., Kolb, E., Separation of emitted and photochemical formaldehyde in Mexico City using a statical analysis and a new pair of gas-phase tracers, *Atmos. Chem. Phys. Discuss*, 5, 11583-11615, 2005;
- Marr, L.C., Dzepina, K., Jimenez, J.L., Relsen, F., Bethel, H.L., Arey, J., Gaffney, J.S., Marley, N.A., Molina, L.T., Molina M.J., Sources and transformations of particle-bound polycyclic aromatic hydrocarbons in Mexico City, *Atmos. Chem. Phys. Discuss.*, 5, 12742-12773, 2005.

- 12) Que en 1995 el Dr. Mario Molina recibió el Premio Nobel de Química.
- 13) Que en la actualidad, el Doctor Mario Molina es Profesor de la Universidad de California, San Diego (UCSD), donde es miembro del Departamento de Química y Bioquímica y del Instituto de Oceanografía Scripps. Asimismo, desde 2005 preside el Centro Mario Molina para Estudios Estratégicos sobre Energía y Medio Ambiente, localizado en la Ciudad de México.
- 14) Que el Dr. Mario Molina, ha estado colaborando como asesor en las líneas de investigación de Ingeniería ambiental y química de la atmósfera en el Posgrado en Procesos Biotecnológicos que conjuntamente operan la Universidad de Guadalajara, a través del Centro Universitario de Ciencias Exactas e Ingenierías (CUCEI), y el Centro de Investigación, Diseño y Desarrollo Tecnológico del Estado de Jalisco, A.C. (CIATEJ).
- 15) Que mediante dictámenes 5606/2008 y CONS-CUCEI/CE/020/2009, de fechas de fechas 23 de Junio de 2008 y 03 de Diciembre de 2009, los Consejos de los Centros Universitarios de Ciencias de la Salud y Ciencias Exactas e Ingenierías propusieron otorgar al Dr. Mario Molina Henríquez el título de "**Doctor Honoris Causa**" de esta máxima Casa de Estudios.
- 16) Que la Universidad de Guadalajara, al otorgar el mencionado doctorado, promueve, reconoce y se compromete con la aportación en dicha área y, específicamente con el Dr. Mario Molina, para generar toda una línea y gama de intercambios, desarrollos académicos que fortalecerán aún más nuestras visiones y quehaceres universitarios.



UNIVERSIDAD DE GUADALAJARA

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Exp. 021

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En virtud de los resultandos antes expuestos, estas Comisiones Conjuntas de Educación y Hacienda encuentran los elementos que justifican la existencia a las necesidades referidas, y

Considerando:

- I. Que la Universidad de Guadalajara es un organismo descentralizado del Gobierno del Estado de Jalisco con autonomía, personalidad jurídica y patrimonio propios, de conformidad con lo dispuesto en el artículo 1 de su Ley Orgánica, promulgada por el Ejecutivo local el día 15 de Enero de 1994, en ejecución del decreto número 15319 del H. Congreso del Estado de Jalisco;
- II. Que es atribución del Consejo General Universitario conferir títulos honoríficos con las categorías de Eméritos y Honoris Causa, de conformidad con lo dispuesto en su Ley Orgánica en el artículo 31, fracción X;
- III. Que el Consejo General Universitario funciona en pleno o por comisiones, las que pueden ser permanentes o especiales, como lo señala el artículo 27 del referido ordenamiento legal;
- IV. Que son funciones y atribuciones de la Comisión de Educación, conforme lo establece el Estatuto General en el artículo 85, en su fracción IV, conocer y dictaminar acerca de las propuestas de los Consejeros, Rector General o de los Titulares de los Centros, Divisiones y Escuelas.
- V. Que es facultad del Rector General, de conformidad con el artículo 35, fracciones I y X de su Ley Orgánica, dirigir el funcionamiento de la Universidad, cumplir y hacer cumplir, en el ámbito de su competencia, las disposiciones de la Constitución Política de los Estados Unidos Mexicanos, la particular del Estado de Jalisco, las de su Ley Orgánica, de sus Estatutos y Reglamentos; así como promover todo lo que tienda al mejoramiento académico, administrativo y patrimonial de la Universidad.
- VI. Que el artículo 11 del Estatuto del Personal Académico señala que la Universidad de Guadalajara, de conformidad con los reglamentos aplicables, podrá otorgar las categorías de Emérito y de Honoris Causa a quienes se han distinguido por sus contribuciones al campo de la educación, la ciencia y la cultura, o quienes han realizado una obra de valía excepcional.
- VII. Que como lo dispone el Reglamento para Otorgar Galardones y Méritos Universitarios en sus artículos 1, 2, 5, 6, 7, del 11 al 14 y demás relativos, la Universidad de Guadalajara reconocerá los méritos y distinciones a través del H. Consejo General Universitario, otorgando entre sus galardones el Dr. Honoris Causa, a propuesta de los Centros Universitarios, Sistemas y Administración General de conformidad con los requisitos establecidos en el mencionado reglamento.



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Por lo anteriormente expuesto y fundado, estas Comisiones Permanentes Conjuntas de Educación y Hacienda nos permitimos proponer los siguientes:

Resolutivos:

PRIMERO. Se propone al pleno del H. Consejo General Universitario aprobar la propuesta de otorgar el título de "Doctor Honoris Causa" de la Universidad de Guadalajara, al Dr. Mario Molina Henríquez, por su valiosa contribución a la Universidad de Guadalajara, a la nación mexicana, a la región latinoamericana y a la humanidad en general, a través de sus aportaciones en el ámbito del cuidado al medio ambiente, principalmente en el tema de los cambios climáticos, como pionero de la química de la capa de ozono de la estratosfera y en la formación académica y difusión científica para diversas Universidades y Organismos Internacionales; a partir de la aprobación del presente dictamen.

SEGUNDO. Llévese a cabo, en sesión solemne del H. Consejo General Universitario ceremonia solemne y pública, la entrega del título de "Doctor Honoris Causa" al Dr. Mario Molina Henríquez.

TERCERO. Facúltese al Rector General de la Universidad de Guadalajara para que ejecute el presente dictamen en los términos de la fracción II, artículo 35 de la Ley Orgánica Universitaria.

Atentamente
"PIENSA Y TRABAJA"

Guadalajara, Jalisco, 20 de Enero de 2010
Comisiones Conjuntas de Educación y Hacienda

Dr. Marco Antonio Cortés Guardado
Presidente

Dr. Roberto Castellán-Rueda

Mtra. Ruth Padilla Muñoz

Mtra. Carlos Benito Ruiz Moreno

Mtro. Pablo Arredondo Ramírez

Dr. Raúl Medina Quintana

Mtro. Roberto Torres González

C. Jorge Abraham Alcalá Sánchez

C. César Antonio Barba Delgadillo

Lic. José Alfredo Peña Ramos
Secretario de Actas y Acuerdos