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NATIONAL RESEARCH COUNCIL ARCHIVES

Dr. ROBERT A. BACK PAPERS
OF THE
DIVISION OF PURE CHEMISTRY

Finding Aid

Prepared by Lynn Delgaty

NRC Archives

December, 1992

Title: R. A. Back Collection.
Dates: 1954-1991.
Extent: 147 cm of textual records.

Biographical Sketch: Dr. Robert (Bob) Arthur Back (1929-1991) joined NRC in 1959, following post-doctoral work at McGill University and the University of Edinburgh. Initially, he was brought in to work under Dr. E.W.R. Steacie in the Division of Chemistry. Later he became head of the Photochemistry and Kinetics Section. Throughout his career, Bob Back often had occasion to collaborate in his research with fellow scientist and wife, Margaret Back. Dr. Back was a pioneer in the field of gas phase reactions and laser isotope separation. During the 1970's he developed the Photochemical Isotope Enrichment (PIE) Project to examine laser production methods for heavy water. These early activities in laser chemistry later developed into a major area of research within the Steacie Institute for Molecular Sciences. When the Photochemistry and Kinetics Section was closed in 1987, Dr. Back took early retirement. He remained active with NRC as a Guest Worker, working in collaboration with the University of Ottawa and with the Chalk River Nuclear Laboratories until his death in 1991.

Custodial History: Three filing cabinets, containing the Back papers, several large maps and two cardboard cartons of books were transferred to NRC Archives in 1992, directly from Dr. Back's office at NRC. Books were removed from the collection and transferred to the CISTI library. An assortment of scientific equipment manuals (54 cm.) were transferred to the National Museum of Science and Technology [ACO155]. The collection retains its original order; the contents of the file folders were transferred to acid free folders and inventoried in December of 1992.

Scope and Content: Fonds consists of research data, research notes, correspondence, articles by Back and lab books pertaining to conferences, Back's work and the work of his co-workers at the NRC. File list available. Some restrictions to access apply.

Series Arrangement:

I	Research	Volume 1.1 through 6.26
II	Conferences	Volume 7.1 through 7.3
III	Correspondence	Volume 7.4 through 7.7
IV	Research Papers	Volume 7.8 through 7.16

Limited access:

Volume 7, files: 7.4, 7.8, 7.9

1	01	Correspondence, research notes and paper: Radiolysis. R.A. Back. Edinborough.	1956-1959
1	02	Correspondence, research notes and paper: Decay of Active Nitrogen at High Temperatures. R. Back, W. Dutton, C.A.Winkler.	1959-1959
1	03	Correspondence, research notes and paper: Scavenger Studies in the α -Radiolysis of Hybocarbon Gases at Very Low Temperatures. Paper. R. Back.	1959-1960
1	04	Correspondence, research notes and paper: Recent Developments in the Chemistry of Active Nitrogen. Symposium Paper. McGill University. R.A. Back and C.A. Winkler Montreal	1959-1959
1	05	Correspondence, research notes and paper: The Thermosyphon as a Simple Circulating Pump for Gases.	1961-1961
1	06	Correspondence, research notes and paper: Physical Measurements of Atom Concentration in Active Nitrogen. R.A. Back and C.A. Winkler.	1959-1960
1	07	Correspondence, research notes and paper: The Use of an Ionization Gauge as a Chromo- tography Detector and a Crusher Technique for analysing Permanent Gases. K.A. McLauchlan. England	1960-1960
1	08	Correspondence, research notes and paper: The Reactions of Active Nitrogen with ... R.A. Back and Mui.	1961-1962
1	09	Correspondence, research notes and paper: The Mercury-photosensitized Decomposition of Methane. R.A. Back and D.Van der Auwera.	1961-1962
1	10	Correspondence, research notes and paper: Photochemistry in the Photo-ionization Region. II. Photochemistry of Methane, Ethane and Ethylene at Wavelengths below 900 A. R.A. Back and D.C.Walker.	1962-1963
1	11	Correspondence, research notes and paper: The Effect of Electric Fields, and a Re- lated Dependence on Dose Rate, in the α -radiolysis of Hydrocarbon Gases. R.A. Back and T.M. Woodward.	1962-1963
1	12	Correspondence, research notes and paper:	

		The Photolysis of Trifluoroacetic Acid Vapour. R.A. Back and S. Mearns.	1963-1964
1	13	Correspondence, research notes and paper: The Photolysis of Water Vapour and Reactions of Hydroxyl Radicals. R.A. Back and A. Ung.	1963-1963
1	14	Correspondence, research notes and paper: The Reaction of Active Nitrogen with Mixtures of Ethylene and Nitric Acid. R.A. Back and E. Fersht.	1963-1964
1	15	Correspondence, research notes and paper: Dosimetry in the Gamma-Radiolysis of Gases. R.A. Back and D.H. Dawes.	1963-1965
1	16	Correspondence, research notes and paper: Combination Reactions of Amino Radicals in the Flash Photolysis of Isocyanic Acid. R.A. Back.	1964-1964
1	17	Correspondence, research notes and paper: The Combination Reactions of Hydroxycyl Radicals in the Flash Photolysis of Water Vapour. R.A. Back and J. Caldwell.	1964-1965
1	18	Correspondence, research notes and paper: The Determination of the Saturation Vapour Pressure of Solid Hydroxylamine Using a Piston Pressure Gauge. R. A. Back and J. Betts.	1965-1965
1	19	Correspondence, research notes and paper: The Photolysis and the Mercury-Photosensitized Decomposition of Hydroxylamine Vapour. R.A. Back and J. Betts.	1965-1965
1	20	Research notes and data: CH ₃ NCO Flash Photolysis. R.A. Back.	1965-1965
1	21	Correspondence, research notes and paper: Reactions of Amino Acids with Hydrocarbon Gases. R.A. Back and J. Brash.	1965-1965
1	22	Correspondence, research notes and data: N ₂ Radiolysis. R.A. Back.	1965-1970
1	23	Correspondence, research notes and paper: The Reaction of Active Nitrogen with Ammonia. R.A. Back and J. Salahub.	1966-1966
1	24	Intermittent field data: O ₂ N ₂ He	

		C. Wood.	1966-1966
1	25	Correspondence, research data and paper: Flash Photolysis of Propane. R.A. Back and D.W.L. Griffiths.	1966-1967
1	26	Correspondence, research data and paper: Flash Photolysis of Ethylene. R.A. Back and D.W.L. Griffiths.	1967-1967
1	27	Correspondence, research data and paper: Ion Lifetimes in Gaseous Radiolysis Systems R.A. Back and D.H. Dawes.	1967-1967
1	28	Correspondence, research data and paper: Quantum Yields and Primary Processes in the Photolysis of HNCO Vapour at 2062 Å. R.A. Back and W.D. Woolley.	1967-1967
1	29	Research notes: CH ₃ + HNCO. R.A. Back and W.D. Woolley.	1967-1967
1	30	Correspondence, research data and paper: Ion Lifetimes in Irradiated Gaseous HCl. R.A. Back and D.A. Armstrong.	1967-1967
1	31	Correspondence, research data and paper: The Photolysis of HNCO Vapour in the Presence of NO and O ₂ R.A. Back and Ketcheson.	1967-1967
1	32	Correspondence, research data and paper: The Hg(6 ³ P ₁)-Sensitized Decomposition of HNCO Vapour and HNCO-H ₂ Mixtures; the Reaction of hydrogen Atoms with HNCO. R.A. Back and Friswell.	1967-1967
02	01	Research notes, data and lab book I: Ion Lifetimes. Terumi Terao.	1967-1967
02	02	Lab books II: Ion Lifetimes. Terumi Terao.	1967-1968
02	03	Lab books II: Ion Lifetimes. Terumi Terao.	1968-1968
02	04	Correspondence, research notes, and data: Ion Lifetimes. The Intermittent-field Method for Gases in Which Electrons Are Not Captured to Form Negative Ions. Terumi Terao.	1967-1967
02	05	Correspondence, research data and paper: The Pyrolysis of HNCO Vapour. R.A. Back and Childs.	1967-1967

02	06	Correspondence, research data and paper: The Photolysis and Pyrolysis of Succinimide Vapour. R.A. Back, Choudhary and Cameron.	1967-1968
02	07	Correspondence, research data and paper: The Radiation-Induced Isotopic Exchange in Vapour. R.A. Back, T. Teraro.	1967-1968
02	08	Lab Book.	1968-1969
02	09	Correspondence, research data and paper: Photochemistry and the Free-radical Reactions in Formamide Vapour. R.A. Back, J.C. Boden.	1969-1969
02	10	Correspondence, research data and paper: A Simple Device for Injecting a Sample from a Sealed Glass Tube into a Gas Chromatograph. R.A. Back, N.J. Friswell J.C. Boden and J.M. Parsons.	1969-1969
02	11	Correspondence, research data and paper: The Photolysis of Acetyl and Ethyl Isocyanates in the Vapour Phase: New Examples of Type II Photo-disassociation R.A. Back, N.J. Friswell.	1969-1969
02	12	Correspondence. Cyclopentadiene R.A. Back.	1967-1970
02	13	Research data and paper: Flash Photolysis of Neopentane. Maika.	1969-1969
02	14	Correspondence, research data and paper: The Mercury 3P_1 Photosensitized Decom- position of Formamide Vapour R.A. Back, J.C. Boden.	1969-1970
02	15	Research data and paper: Ion Lifetimes J.A. Briggs	1970-1970
16		Correspondence, research data and paper: The High Temperature Photolysis of Form- amide Vapour and the Thermal Decomposition of the NH_2CO Radical. R.A. Back, J. Boden.	1969-1970
02	17	Correspondence, notes: HNCO Photolysis R.A. Back.	1970-1970
02	18	Correspondence, research data and paper: Thermal reactions of Sodium Azide in the Presence of Nitric Oxide and Hydrogen R.A. Back, J.C. Boden.	1967-1971

02	19	Research data and paper: Summer Project: Continuous Gas Chromatography. P. Sekkens.	1967-1971
02	20	Correspondence, research data and paper: The Effect of electric Fields on the Radiolysis of Acetylene, and the Mechanism of Cuprene Formation. R.A. Back, J.P. Briggs.	1970-1971
02	21	Research data and notes: Na N ₃ Py.	1971-1971
02	22	Correspondence, research data and paper: Absolute Rate Constants for Azide in the Presence of Nitric Oxide and Hydrogen R.A. Back, J.C. Boden.	1972-1972
02	23	Correspondence, research paper: The Stability of Di-imide. R.A. Back, C. Willis.	1972-1972
02	24	Research notes, data and lab book: Continuous VPC. Paul Naftel.	1972-1972
03	01	Correspondence, research data and paper: A Brief Exploratory Study of the Photolysis of Azodicarbonamide (ADC) in Solution R.A. Back and von Mirbach.	1973-1973
03	02	Research data and lab book: HNCO. Mike Dunn.	1973-1973
03	03	Correspondence, research data and paper: Absolute Rate Constants for Reactions of Free Radicals in the High Temperature Photolysis of Formide Vapour. Part II: Amino Radicals. R.A. Back, T. Yokota.	1973-1973
03	04	Correspondence, research data and paper: Di-imide: Some Physical and Chemical Properties and the Kinetics and Stoichiometry of the Gas Phase Decomposition. R.A. Back and C.Willis.	1973-1973
03	05	Correspondence, research data and paper: The Reaction of Di-imide with Olefins in the Gas Phase. R.A. Back, C. Willis, S. Vidyarthi and R. McKittrick.	1974-1974
03	06	Research data and notes: N ₂ H ₂ - Liquid N H ₃ Spectrum and Decay. R.A. Back and C. Willis.	1974-1974
03	07	Research data and notes: Furaldehyde. R.A. Back, Ghandini.	1960-1960

03	08	Correspondence, data notes and paper: The Florescence of Ammonia-d ₃ from its First Exited Singlet State. S. Koda, R.A. Back and P. Hackett.	1974-1974
03	09	Correspondence, research data and paper: The Near-Ultraviolet Absorption Spectrum of Di-imide Vapour ¹ . R.A. Back and C. Willis.	1972-1975
03	10	Correspondence: Theory of Line Shapes in Resonance Scattering Spectra. R.A. Back and P.A Hackett.	1975-1975
03	11	Correspondence and research data: The Thermal and Photochemical Decomposition... R.A. Back, S. Vidyarthi and C. Willis.	1975-1975
03	12	Research paper: The Role of Vibrational decomposition of Water. A.C. Vickis, comments by R.A. Back.	1976-1976
03	13	Correspondence and Research data: CH ₄ Pyrolysis: Part II. Back and Chen.	1976-1976
03	14	Lab book: Parson's Practica.	1976-1976
03	15	Correspondence and Research paper: Two Photon Photo-disassociation of NH ₃ with a Tunable Dye Laser, Detected by NH ₂ Florescence Exited by the Same Light Source. D. Dirkson, S. Lieu.	1976-1976
03	16	Research data and paper: The Photo- dissociation of Ammonia in the A-X Absorption System. Part I: Deuterium Isotope Shifts in the Photodissociation R.A. Back and S. Koda.	1976-1976
03	17	Correspondence, research data and paper: The Photodissociation of Ammonia, A-X Absorption System. Part. II: Translational Excitation of the Hydrogen Atoms Produced, and the Mechanism of the Predissociation R.A. Back and S. Koda.	1976-1976
03	18	Correspondence, research data and paper: The Photodissociation of Ammonia, A-X Absorption. System Part III: Isotope Shifts and Photochemical Separation of Nitrogen Isotope in Ammonia-d ₃ . R.A. Back and S. Koda.	1976-1976

04	01	Research data and paper: Ethanol HF Laser Decomposition.	1977-1977
04	02	Research data and paper: Ti Cl ₄ .	1977-1977
04	03	Correspondence: Reactions of Diimide with Unsaturated Compounds. R.A. Back, C. Willis.	1977-1977
04	04	Correspondence and Research paper: PIE Project.	1971-1979
04	05	Research data and correspondence: The Effect of Oxygen on the Thermal Decomposition of Cyclobutanone: a Thermal Triplet Reaction? R.A. Back, M.H. Back.	1979-1979
04	06	Research data and correspondence: The The Decomposition of Cyclobutanone Vapor Induced by Infrared Radiation From a Pulsed CO ₂ Tea Laser. R.A. Back, M.H. Back.	1979-1979
04	07	Research data and correspondence: Cyclobutanone R.A. Back.	1979-1979
04	08	Lab Book: R.A.Back.	1979-1979
04	09	Lab Book: P.Neudorfl.	1979-1980
04	10	Research data and report: Diimide Kinetics Panel.	1980-1980
04	11	Correspondence, research data and paper: The Absorption Spectrum of Trans-Diimide (N ₂ H ₂) in the Vacuum Ultraviolet Region. R.A. Back, P.S. Neudorfl and A.E. Douglas.	1980-1980
04	12	Research data: Na N ₃ Laser Pyrolysis.	1980-1980
04	13	Correspondence, research data and paper: The Decomposition of C ₂ H ₅ OH by IR Radiation from a Pulsed CO ₂ Laser. R.A. Back, A. Gandini.	1980-1980
04	14	Research data and notes: Thermal and Photochemical Decomposition of Glutaric Anhydride.	1980-1980
04	15	Correspondence, research data and paper: Pressure and Fluence Dependence in the Decomposition of Cyclobutanone Vapor by a Pulsed CO ₂ Laser.	1981-1981
04	16	Correspondence, research data and notes: Ethylene and Vinylene.	1972-1982

04	17	Correspondence, research data and notes: The Thermal and Photochemical decomposition of Maleic Anhydride Vapor in the Gas Phase. R.A. Back, J.M. Parsons.	1980-1982
04	18	Lab Book.	1980-1982
04	19	Correspondence, research data and notes: The Gas Phase Thermal Decomposition of Cyclobutanol. R.A. Back.	1981-1982
04	20	Research data and notes: Inversion Reactions.	1981-1982
04	21	Correspondence, research data and notes: The Thermal and Photochemical Decomposition of CIS-1, 2-Cyclobutane-Dicarboxylic Anhydride in the Vapor Phase. R.A. Back, J.M. Parsons.	1982-1982
04	22	Correspondence and notes: Tetrazine.	1972-1982
04	23	Research data and notes: Inversion Reactions in Ethane Decomposition.	1982-1982
05	01	Correspondence, research data and notes: The Thermal and Photochemical Decompositions of Succinic Anhydride and 2,3-Dimethyl Succinic Anhydride in the Gas Phase. R.A. Back, S. Yamamoto.	1983-1983
05	02	Correspondence, research data and paper: The Ultraviolet Absorption Spectrum of Oxalic Acid Vapor. R.A. Back.	1983-1984
05	03	Correspondence, research data and paper: The Gas Phase Photochemistry and Thermal Decomposition of Glyoxalic Acid Vapor. R.A. Back, S. Yamamoto.	1983-1984
05	04	Correspondence, research data and paper: The Gas Phase Photochemistry of Oxalic Acid. R.A. Back, S. Yamamoto.	1984-1984
05	05	Correspondence, research data and paper: Experiments with a Cyclic Closed-loop Chromatograph. R.A. Back and R. Black.	1984-1984
05	06	Correspondence, research notes: M. Hrytsak.	1984-1984
05	07	Correspondence, research data and paper: Multiphoton Absorption and Decomposition Studies of Cyclobutanone Close to the	

		Collisionless Regime. R.A. Back, D.K. Evans and H. Adams.	1981-1984
05	08	Correspondence, research data and notes: The Preparation, Properties and Reactions of Diimide. R.A. Back.	1984-1984
05	09	Correspondence, research data and paper: The Photolysis and Thermal Decomposition of Pyruvic Acid in the Gas Phase. R.A. Back, S. Yamamoto.	1984-1984
05	10	Correspondence, research data and paper: The Thermolysis and Photolysis of Dimethylcyclobuten - 1.2 dione in the Gas Phase. R.A. Back and J. Cao.	1985-1985
05	11	Correspondence, research data and paper: The Thermal Decomposition of Cyclobuten- 1.2 dione. R.A. Back and J. Cao.	1985-1985
05	12	Correspondence, research data and paper: The Photochemistry of 1,2-cyclobutanedione in the Gas Phase. R.A. Back and J. Cao.	1985-1985
05	13	Correspondence, research data: Emission of CDP and DMC. J.Cao.	1985-1985
05	14	Correspondence, research data and paper: The Thermolysis and Photolysis of Malonic Acid in the Gas Phase. R.A. Back and J. Cao.	1985-1985
05	15	Correspondence, research data and paper: Product Ratios in the Photolysis of CIS- and Trans-Glyoxal at Low Pressures: The Mechanisms of the Thermal and Photochemi- cal Decompositions. R.A. Back and J. Cao.	1985-1985
05	16	Research data and paper: C ₂ H ₄ 249 and 308 nm.	1985-1986
05	17	Research data and paper: C ₂ H ₄ 242 and 308 nm.	1985-1986
06	01	Correspondence, research data and paper: The Infrared Multiphoton Decomposition of Cis-2-pentene and 3-methyl-cis-2-pentene. R.A. Back and G.J. Collin.	1985-1986
06	02	Correspondence, research data and notes: The Visible Absorption Spectrum of 1,2-Cyclobutanedione in the gas phase. R.A. Back, J.M. Parsons.	1985-1986

06	03	Correspondence, research notes and paper: Ethylene Photolysis. 222-309 nm.	1985-1986
06	04	Correspondence, research data and notes: The Infrared Multiphoton Absorption and Decomposition of Ethanol Vapour. R.A. Back, D.K. Evans, R.D. McAlpine, E.M. Verpoorte, M. Ivanco, J.W. Goodale and H.M. Adams.	1987-1987
06	05	Research notes and data: 1,2 cyclobutadione.	1985-1986
06	06	Research data and notes: Infrared chemiluminescence of HF in the Reacton of F with Trans-diiimide ¹ . R.A.Back, P.S.Neudorfl and J.J. Sloan.	1987-1987
06	07	Research data and notes: The Emission Spectra of 1,2-cyclobu- tanedione Excited at 488.0 nm R.A. Back and J.M. Parsons.	1987-1987
06	08	Research data and notes: Cyclopropane Carboxaldehyde.	1987-1988
06	09	Research data and notes: C ₂ H ₄ .	1987-1988
06	10	Correspondence, research data and paper: The Photolysis of CO at 193 nm in the Liquid and Gas Phases. R.A. Back and P.B. Roussel.	1988-1988
06	11	Correspondence, research data and notes: The Rotational Isomerization of Ethylene R.A. Back M.H. Back and L. Giroux.	1988-1988
06	12	Correspondence, research data and paper: Photochemistry of CO-H ₂ Mixtures Irradiated at 193.3 nm R.A. Back and P.B. Roussel.	1988-1989
06	13	Research data and notes: IR Multiphon Decomposition of C ₂ D ₆ (127).	1987-1989
06	14	Correspondence, research data and notes: The Photolysis of Ethylene at 193 nm R.A. Back M.H. Back and L. Giroux.	1988-1989
06	15	Research notes: The Photolysis of C ₂ H ₄ .	1989-1989

06	16	Correspondence, research data and paper: The Absorption of Pulsed CO ₂ -Laser Radiation by Ethylene at Total Pressures From 25 to 3000 Torr. R.A.Back, M.H.Back and L.Giroux.	1989-1989
06	17	Correspondence, research data and paper: The Decomposition of Ethylene by Pulsed CO ₂ -Laser Radiation at Pressures from to 3000 Torr and the Use of the 2C ₂ H ₄ Cyclobutane Equilibrium as an Internal Thermometer. R.A. Back, M.H. Back and L. Giroux.	1990-1990
06	18	Correspondence and papers: Laser Initiated Thermal Reactions and Isotopically selective Decomposition of 1,1,1-Trichlorethane G.A. Back, G.A. McRae and L. Ivanco.	1991-1991
06	19	Lab book: Absorption Spectra for Cyclopropane, Neopentane and Triflouracetamide.	1991-1991
06	20	Research data: 2,3 Dimethylmaleic Anhydrid.	n.d.
06	21	Research data: Pthallic Anhydride.	n.d.
06	22	Research data: Citraconic Anhydride.	n.d.
06	23	Research data: Photolysis of 1,Hydroxycyclobutane.	n.d.
06	24	Research data: Photolysis of Cyclopentadiene.	n.d.
06	25	Research data: Biacetyl Spectrum.	n.d.
06	26	Research data: Spectography.	n.d.
07	01	List of participants: International Conference on the Photosynthetic Unit May 18-21, 1970.	1970-1970
07	02	List of participants and agenda: Conference on Isotopic Separation Nov 26, 1974.	1974-1974
07	03	Catalogue and agenda. 74th Canadian Chemical Conference and Exhibition. Nov 26, 1974.	1974-1974
07	04	Correspondence. A. Gandini. Confidential.	1973-1981
07	05	Correspondence. J. Cao. Beijing.	1987-1987
07	06	Correspondence and addresses.	

		Terao, Yamamoto, Teijivo, Walker.	1991-1991
07	07	Correspondence re: Patent Application. Photochemical Separation of Isotopes.	1979-1983
07	08	Unpublished papers of colleagues Reviewed by R.A. Back. Confidential.	1975-1991
07	09	Report. HWP-LIS-R-I. Atomic Energy Canada. Confidential.	1979-1979
07	10	Miscellaneous papers. Authors unknown.	n.d.
07	11	Reprints of published papers. M.H. Back.	1965-1983
07	12	List of published papers. R.A. Back.	1965-1983
07	13	Reprints of published papers. R.A. Back. 1954-1959	1954-1959
07	14	Reprints of published papers. R.A. Back. 1960-1969	1954-1959
07	15	Reprints of published papers. R.A. Back. 1970-1979	1970-1979
07	16	Reprints of published papers. R.A. Back. 1981-1991	1981-1991