

JUN. 16 1979

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PUBLICATIONS OF H. TRACY HALL

1. Graham W. Marks and H. Tracy Hall, "A Method for the Spectrochemical Determination of Germanium, Tin and Lead in Ore Samples," U. S. Bureau of Mines Report of Investigations No. R.I. 3965, Nov. 1946, 38 pp.
2. H. Tracy Hall and Henry Eyring, "The Constitution of Chromic Salts in Aqueous Solution," J. Am. Chem. Soc., 72, 782-790 (1950).
3. Graham W. Marks and H. Tracy Hall, "Transmission Characteristics in the Visible Spectral Region of the Quinalizarin and Beryllium - Quinalizarin Complex in N/4 Sodium Hydroxide Solution," U. S. Bureau of Mines Report of Investigations No. 4741, Oct. 1950, 5 pp.
4. H. Tracy Hall and Raymond M. Fuoss, "Empirical Analysis of Viscosity Data," J. Am. Chem. Soc., 73, 265-269 (1951).
5. H. Tracy Hall, "Molecular Weight of Polytrifluorochloroethylene by Light Scattering," J. Polymer. Sci., 7, 443-447 (1951).
6. H. Tracy Hall, Edward L. Brady and Paul D. Zemany, "Viscosity of Polytrifluorochloroethylene in O-Chlorobenzotrifluoride," J. Am. Chem. Soc., 73, 5460 (1951).
7. H. Tracy Hall, "The Solubility of Polytrifluorochloroethylene," J. Am. Chem. Soc., 74, 68-71 (1952).
8. H. Tracy Hall, "A New Method of Mounting Diamonds," Rev. Sci. Instrum., 25, 1035-1036 (1954).
9. F. P. Bundy, H. T. Hall, H. M. Strong and R. H. Wentorf, "Man-Made Diamonds," Nature, 176, 51-54 (1955).
10. H. Tracy Hall, "The Melting Point of Germanium as a Function of Pressure to 180,000 Atmospheres," J. Phys. Chem., 59, 1144-1146 (1955).
11. H. Tracy Hall, "Chemistry at High Temperature and High Pressure," Research and Engineering, 11, 27-28 (1956).
12. H. Tracy Hall, "Chemistry at High Temperature and High Pressure," High Temperature--A Tool for the Future, Stanford Research Institute, Menlo Park, California, 161-166 (1956).
13. H. Tracy Hall, "What the Sunday School has Done for Me," The Instructor, 91, 341 (1956).
14. H. Tracy Hall, "Chemistry at High Pressures and High Temperatures," J. Wash. Acad. Sci., 47, 300-304 (1957).
15. H. Tracy Hall, Billings Brown, Bruce Nelson and Lane A. Compton, "I. An Apparatus for Use with Condensed Phases at 10,000 Deg. II. Some Thermo-dynamic Considerations at Very High Temperatures," J. Phys. Chem., 62, 346-351 (1958).
16. H. Tracy Hall, "Some High Pressure, High Temperature Apparatus Design Considerations: Equipment for Use at 100,000 Atmospheres and 3000 Deg. C," Rev. Sci. Instrum., 29, 267-275 (1958).

✓ 4000C903

- See no. 16
- 17. H. Tracy Hall, "Ultrahigh Pressure Research," Science, 128, 445-449 (1958).
  - 18. H. Tracy Hall and S. S. Kistler, "High Pressure Developments," Annual Review of Physical Chemistry, Annual Reviews, Inc., Palo Alto, California, 395-416 (1958).
  - 19. H. Tracy Hall, "Diamonds," Proceedings of the Third Conference on Carbon (held at University of Buffalo, Buffalo, N. Y., June 1957), Pergamon Press, London, pp. 75-84.
  - 20. H. Tracy Hall, "Ultrahigh Pressures," Sci. American, 201, 61-67 (1959).
  - 21. H. Tracy Hall, "High Pressure Methods," Proceedings of an International Symposium on High Temperature Technology, Asilomar Conference Grounds, California, Oct. 6-9, 1959; Arranged by Stanford Research Institute, Menlo Park, California, McGraw-Hill, New York, pp. 145-156 and 335-336 (1960).
  - 22. H. Tracy Hall, "Ultrahigh Pressure, High Temperature Apparatus: The Belt," Rev. Sci. Instrum., 31, 125-131 (1960).
  - 23. H. P. Bovenkerk, F. P. Bundy, H. T. Hall, H. M. Strong, and R. H. Wentorf, Jr., "The Preparation of Diamond," Nature, 184, 1094-1098 (1959).
  - 24. J. Duane Dudley and H. Tracy Hall, "Experimental Fusion Curves of Indium and Tin to 105,000 Atmospheres," Phys. Rev., 118, 1211-1216 (1960).
  - 25. H. T. Hall, "Some High Pressure, High Temperature Apparatus Design Considerations: Equipment for use at 100,000 Atmospheres and 3000°C," Series of Selected Papers in Physics, Solid State Physics in High Pressure, The Physical Society of Japan, Dept. of Physics, University of Tokyo, Japan (1960), pp. 6-14, Reprinted from Rev. Sci. Instrum., 29, 267-275 (1958).
  - 26. H. Tracy Hall, "High Pressure Apparatus," Progress in Very High Pressure Research, Proceedings of an International Conference Held at Bolton Landing, New York, June 13-14, 1960, edited by Bundy, Hibbard, and Strong (John Wiley and Sons, Inc., Publishers), pp. 1-9 (1961).
  - 27. H. Tracy Hall, "Possible Future Roles of the Utah Academy," Presidential Address, Proceedings, Utah Academy of Sciences, Arts and Letters, 38, 8-10 (1961).
  - 28. H. Tracy Hall, "The Synthesis of Diamond," J. Chem. Educ., 38, 484-489 (1961).
  - 29. H. Tracy Hall, "Anvil Guide Device for Multiple-Anvil High Pressure Apparatus," Rev. Sci. Instrum., 33, 1278-1280 (1962).
  - 30. H. Tracy Hall, J. Dean Barnett and Leo Merrill, "Ytterbium: Transition at High Pressure from Face-Centered Cubic to Body-Centered Cubic Structure," Science, 139, 111-112 (1963).
  - 31. H. Tracy Hall and Leo Merrill, "Some High Pressure Studies on Ytterbium," Inorg. Chem., 2, 618-624 (1963).

✓ 40000904

- see  
# 24
- 32. H. Tracy Hall, "High Pressure, High Temperature," pp. 730-738, Perspectives in Materials Research, edited by L. Hinnel, J. J. Harwood, and W. J. Harris, Jr., Office of Naval Research, Dept. of the Navy, Washington, D. C., Surveys of Naval Science, No. 10, February 1963. (Note: This material was written four years before the book was published).
  - 33. J. Dean Barnett, Roy B. Bennion, H. Tracy Hall, "High Pressure X-ray Diffraction Studies on Barium," Science, 141, 534-535 (1963).
  - 34. H. T. Hall, "High Pressure Apparatus," in The Physics of High Pressures, edited by K. Swenson, (in Russian) published in Moscow (1963). This paper translated from my paper presented at the International High Pressure Conference held at Bolton Landing, New York, June 13-14, 1960.
  - 35. J. Dean Barnett, Roy B. Bennion, H. Tracy Hall, "X-ray Diffraction Studies on Tin at High Pressure and High Temperature," Science, 141, 1041-2 (1963).
  - 36. Donald R. Hall and H. Tracy Hall, "Missionary Diary of Helon Henry Tracy in the United States and Great Britain 1881-1882," private publication, 158 pp., 300 copies printed (1963).
  - 37. H. Tracy Hall, "High Pressure/Temperature Apparatus," chapter 4 (pp. 133-179), Metallurgy at High Pressures and High Temperatures, edited by K. A. Gschneidner, Jr., M. T. Hepworth, and N. A. D. Parlee; Gordon and Breach Science Publishers, New York, 1964.
  - 38. J. Dean Barnett and H. Tracy Hall, "High Pressure-High Temperature X-ray Diffraction Apparatus," Rev. Sci. Instrum., 35, 175-182 (1964).
  - 39. H. T. Hall, "Polymorphism and High Pressure," B. Y. U. Studies, 5, 139-153 (1964).
  - 40. H. T. Hall, Guest Editorial, "High Pressure," Experimental Mechanics, 4, 3-A (1964).
  - 41. H. T. Hall, L. Merrill and J. D. Barnett, "High Pressure Polymorphism in Cesium," Science, 146, 1297-1299 (1964).
  - 42. H. T. Hall, "High Pressure Chemistry," in Progress in Inorganic Chemistry, Vol. 7, edited by F. A. Cotton, Interscience Publishers, pp. 1-38 (1966).
  - 43. H. T. Hall, "Periodic Compounds: Syntheses at High Pressures and Temperatures," Science, 148, 1331-1333 (1965).
  - 44. H. T. Hall and L. A. Compton, "Group IV Analogs and High Pressure, Temperature Synthesis of  $B_2O_3$ ," Inorg. Chem., 4, 1213-1216 (1965).
  - 45. W. E. Evenson and H. T. Hall, "Volume Measurements on Chromium to 30 kilobars," Science, 150, 1164-1165 (1965).
  - 46. J. D. Barnett, V. E. Bean, and H. T. Hall, "X-ray Diffraction Studies on Tin to 100 Kilobars," Journal of Applied Physics, 37, 875-877 (1966).
  - 47. R. N. Jeffery, J. D. Barnett, H. Vanfleet, H. T. Hall, "A Pressure Scale to 100 Kilobar Based on Compression of Sodium Chloride," J. Appl. Phys., 37, 3172-3180 (1966).

40000905

- 48. H. T. Hall, "Hydraulic Ram Design for Modern High Pressure Devices," Rev. Sci. Instrum., 37, 568-571 (1966).
- 49. H. T. Hall, "A Tetrahedron Problem," Math. Mag., 38, 241 (1965). prob. No. 598.
- 50. H. T. Hall, "A Scientist Looks at the Miracles of Jesus," The Instructor, 101, 86-87 (1966).
- 51. H. T. Hall, "Transformations in Solids at High Pressure," Proceedings of Fourth Meeting, Cape Kennedy, Florida, March 16-18, 1966, Thermochemistry Working Group, Interagency Chemical Rocket Propulsion Group, Chemical Propulsion Information Agency, Publication No. 108, June 1966, Volume 1, pp. 67-74.
- 52. H. T. Hall, "High Temperatures, High Pressures, and Periodic Compounds," High-Temperature Chemistry, National Academy of Sciences, National Research Council Publication 1470, Washington, D. C., 1967, pp. 65-66.
- 53. H. T. Hall (Book), "High Pressures (to 100,000 Atmospheres at 1500 Deg. C)," American Institute of Chemical Engineers, Today Series, 345 West 47th St., New York, N. Y. 10017, (1967), 179 pp.
- 54. H. T. Hall, "High Pressure Apparatus: Ram-In-Tie-Bar Multianvil Presses," Rev. Phys. Chem. Japan, 37, 63-71 (1967).
- 55. R. B. Bennion, H. G. Miller, W. R. Myers, H. T. Hall, "100 Kbar Press for Time-of-Flight Neutron Diffraction," Acta Cryst., 25A, S71 (1969).
- 56. N. L. Eatough and H. T. Hall, "High Pressure Synthesis of Rare Earth Diantimonides," Inorg. Chem., 8, 1439 (1969).
- 57. N. L. Eatough, Alan W. Webb, and H. T. Hall, "High Pressure  $\text{Th}_3\text{P}_4$ -Type Polymorphs of Rare Earth Sesquichalcogenides," Inorg. Chem., 8, 2069-2071 (1969).
- 58. J. D. Barnett, J. Pack, and H. T. Hall, "Structure Determination of a Ferroelectric Phase of Sodium Nitrate Above 45 Kilobar," Proceedings of the Symposium on Crystal Structure at High Pressure at Pacific Science Center, Seattle, Washington, March 24, 1969, Transactions of the American Crystallographic Association, 5, 113-131 (1969), Available from Polycrystal Book Service, P. O. Box 11567, Pittsburgh, Pennsylvania 15238.
- 59. N. L. Eatough and H. T. Hall, "High Pressure Synthesis of Lutetium Diantimonide," Inorg. Chem., 9, 416-417 (1970).
- 60. N. L. Eatough and H. T. Hall, "High Pressure  $\text{Th}_3\text{P}_4$ -Type Polymorphs of Rare Earth Sesquiselenides," Inorg. Chem., 9, 417-418 (1970).
- 61. A. W. Webb and H. T. Hall, "High Pressure Synthesis of Rare Earth Polyselenides," Inorg. Chem., 9, 843-847 (1970).
- 62. A. W. Webb and H. T. Hall, "High Pressure Synthesis of Rare Earth Polysulfides," Inorg. Chem., 9, 1084 (1970).
- 63. H. T. Hall, "High Pressure Synthesis Involving Rare Earths," Rev. Phys. Chem. Japan, 39, 110-116 (1969).

40000906

79. Karl A. Miller and H. Tracy Hall, "High-Pressure Synthesis of Lutetium Trilead," *J. Less-Common Metals*, 32, 275-78 (1973).
80. J. F. Cannon, D. L. Robertson, H. T. Hall and A. C. Lawson, "The Effect of High Pressure on the Crystal Structure of  $\text{LaOs}_2$  and  $\text{CeOs}_2$ ," *J. Less-Common Metals*, 31, 174 (1973).
81. A. C. Lawson, J. F. Cannon, D. L. Robertson and H. T. Hall, "Superconductivity of  $\text{LaOs}_2$ ," *J. Less-Common Metals*, 32, 173-74 (1973).
82. J. F. Cannon, D. L. Robertson, H. T. Hall and A. C. Lawson, "High Pressure Synthesis of Beta-W-Type  $\text{Nb}_3\text{Te}$ ," *J. Phys. Chem. Solids*, 35, 1181-82 (1974).
83. J. F. Cannon and H. T. Hall, "Effect of High Pressure on the Crystal Structures of Lanthanide Trialuminides," *J. Less-Common Metals*, 40, 313-28 (1975).
84. H. Tracy Hall, "Retraction System for Multi-anvil Presses," *Rev. Sci. Instrum.*, 46, 436-38 (1975).
85. H. Tracy Hall, "Sintered Diamond", Brigham Young University Studies, 16, 43-47 (1975) [Special Centennial Issue]
86. J. F. Cannon, D. M. Cannon, and H. T. Hall, "High Pressure Synthesis of  $\text{SmB}_2$  and  $\text{GdB}_{12}$ ," *J. Less-Common Metals* 56, 83-90, (1977).
87. J. F. Cannon and H. T. Hall, "High Pressure Synthesis of Lanthanide/Boron and Actinide/Boron Compounds," in *Rare Earths in Modern Science and Technology*, edited by G. J. McCarthy and J. L. Rhyne, Plenum Press, New York and London (1978) pp 219-224.

40000908

64. J. F. Cannon and H. T. Hall, "High Pressure Synthesis of Selected Lanthanide-Tellurium Compounds," Inorg. Chem., 9, 1639-43 (1970).
65. H. T. Hall, "Personal Experiences in High Pressure," The Chemist, 47, 276-79 (1970).
66. H. T. Hall, "Sintered Diamond: A Synthetic Carbonado," Science, 169, 868-69 (1970).
67. H. T. Hall, "The Synthesis of Diamond," in Advances in Chemical Physics, Vol. XXI, entitled, "Chemical Dynamics," (papers in honor of Henry Eyring), Eds. Hirschfelder and Henderson, John Wiley, New York (1971), pp. 721-35.
68. H. T. Hall, "High Pressure Scale by X-ray Diffraction Techniques up to Approximately 100 kbar," in Accurate Characterization of the High-Pressure Environment, Ed. E. C. Lloyd, U. S. Dept. of Commerce, National Bureau of Standards Special Publication 326, pp. 303-06 (U. S. Government Printing Office, Washington, D. C. 20402; Catalog No. C 13.10:326). March 1971
69. H. T. Hall, "Fixed Points Near Room Temperature," in Accurate Characterization of the High-Pressure Environment, Ed. E. C. Lloyd, U. S. Dept. of Commerce, National Bureau of Standards Special Publication 326, pp. 313-14 (U. S. Government Printing Office, Washington, D. C. 20402; Catalog No. C 13.10:326). March 1971
70. F. William Linsley, Jr., Jerald S. Bradshaw and H. Tracy Hall, "High Pressure Affects on Conjugated Aromatic Compounds," Rev. Phys. Chem. Japan, 40, 69-72 (1970).
71. D. L. Decker, W. A. Bassett, L. Merrill, H. T. Hall and J. D. Barnett, "High Pressure Calibration: A Critical Review," J. Phys. Chem. Ref. Data, 1, 773-836 (1972).
72. K. A. Miller and H. T. Hall, "High Pressure Synthesis of Rare Earth Tri-Tin Compounds," Inorg. Chem., 11, 1188-91 (1972).
73. J. F. Cannon, D. L. Robertson and H. T. Hall, "Synthesis of Lanthanide-Iron Laves Phases at High Pressures and Temperatures," Mater. Res. Bull., 7, 5-12 (1972).
74. N. L. Eatough and H. T. Hall, "High Pressure Synthesis of  $\text{REMn}_2$  Compounds with the  $\text{MgZn}_2$  (Laves) Structure," Inorg. Chem., 11, 2608-09 (1972).
75. J. F. Cannon, D. L. Robertson and H. T. Hall, "The Effect of High Pressure on the Formation of  $\text{LRu}_2$  and  $\text{LOs}_2$  (L = Lanthanide) Compounds," J. Less-Common Metals, 29, 141-46 (1972).
76. D. L. Robertson, J. F. Cannon and H. T. Hall, "High Pressure and High Temperature Synthesis of  $\text{LaCo}_2$ ," Mater. Res. Bull., 7, 977-81 (1972).
77. J. M. Leger and H. Tracy Hall, "Pressure and Temperature Formation of  $\text{A}_3\text{B}$  Compounds. I.  $\text{Nb}_3\text{Si}$  and  $\text{V}_3\text{Al}$ ," J. Less-Common Metals, 32, 181-87 (1973).
78. J. M. Leger and H. Tracy Hall, "Pressure and Temperature Formation of  $\text{A}_3\text{B}$  Compounds. II.  $\text{Nb}_3\text{Ge}$ ,  $\text{Nb}_3\text{Sn}$ ,  $\text{Nb}_3\text{Pb}$ ," J. Less-Common Metals, 34, 17-24 (1974).

✓ 40000907

79. Karl A. Miller and H. Tracy Hall, "High Pressure Synthesis of Lutetium Trilead," *J. Less-Common Metals*, 32, 275-78 (1973).
80. J. F. Cannon, D. L. Robertson, H. T. Hall and A. C. Lawson, "The Effect of High Pressure on the Crystal Structure of  $\text{LaOs}_2$  and  $\text{CeOs}_2$ ," *J. Less-Common Metals*, 31, 174 (1973).
81. A. C. Lawson, J. F. Cannon, D. L. Robertson and H. T. Hall, "Superconductivity of  $\text{LaOs}_2$ ," *J. Less-Common Metals*, 32, 173-74 (1973).
82. J. F. Cannon, D. L. Robertson, H. T. Hall and A. C. Lawson, "High Pressure Synthesis of Beta-W-Type  $\text{Nb}_3\text{Te}$ ," *J. Phys. Chem. Solids*, 35, 1181-82 (1974).
83. M. D. Horton, B. J. Pope and H. T. Hall, "Sintered Diamond," International Industrial Diamond Association Symposium, Washington, D. C. (1974).
84. B. J. Pope, M. D. Horton, H. T. Hall, L. S. Bowman and H. Adaniya, "Sintered Diamond: Its Possible Use as a High Thermal Conductivity Semiconduction Device Substrate," Proc. 4th International Conference on High Pressure (AIRAPT), Kyoto, Japan (1974).
85. B. J. Pope, M. D. Horton, H. T. Hall and S. DiVita, "Selection and Treatment of Diamond Particulates in Preparation for High Thermal Conductivity Ceramics by Sintering at High Temperature and Ultra-high Pressure," Proc. Ninth Annual University Conference on Ceramic Science of the American Ceramic Society, Orlando, Florida (1975).
86. J. F. Cannon and H. T. Hall, "Effect of High Pressure on the Crystal Structures of Lanthanide Trailuminides," *J. Less-Common Metals*, 40, 313-28 (1975).
87. H. Tracy Hall, "Retraction System for Multi-anvil Presses," *Rev. Sci. Instrum.*, 46, 436-38 (1975).
88. H. Tracy Hall, "Sintered Diamond," Brigham Young University Studies, 16, 43-47 (1975) [Special Centennial Issue].
89. J. F. Cannon, D. M. Cannon, and H. T. Hall, "High Pressure Synthesis of  $\text{SmB}_2$  and  $\text{GdB}_{12}$ ," *J. Less Common Metals* 56, 83-90, (1977).
90. J. F. Cannon, H. T. Hall, "High Pressure Synthesis of Lanthanide/Boron and Actinide/Boron Compounds," in *Rare Earths in Modern Science and Technology*, edited by G. J. McCarthy and J. J. Rhyne, Plenum Press, New York & London (1978) pp. 219-224.  
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91. Chapter I, "Introduction" to *Chemical Experimentation Under Extreme Conditions, Techniques of Chemistry*, Vol IX, Eds. A. Weissberger and B. Rossiter, John Wiley & Sons (1980) pp. 1-8.
92. Chapter II, "High Pressure Techniques", *Ibid.* pp. 9-72.

- 1980 Admitted to practice patent law before the U.S. Patent and Trademark office as an agent, registration number 29,800, June 23.
- 1980 "Man of the Year Award," Abrasive Engineering Society, Milwaukee, Wisconsin
- 1978 "Karl G. Maser Research Award," Brigham Young University, Provo, Utah August 31
- 1977 "International Prize for New Materials," The American Physical Society, San Diego, California, March 22
- 1975 "Distinguished Alumni Award," Weber State University, Ogden, Utah, October 16
- 1974 "IR-100 Award," Industrial Research Magazine for Indexable Sintered Diamond Tools, Chicago, October 8 *Sintered*
- 1973 "Engineering Materials Achievement Award," The American Society for Metals, Chicago
- 1973 American Chemical Society Tour Speaker (Texas, Louisiana)
- 1973 The American Society for Metals "Engineering Materials Achievement Award," Chicago, October 2, Conrad Hilton Grand Ballroom
- 1972 American Chemical Society Tour Speaker (Oregon, Washington)
- 1972 Fellow, The American Institute of Chemists
- 1972 The Intermountain Society of Inventors and Designers "Certificate for Distinguished Service and Leadership in the Field of Invention and Designing," Salt Lake City, Utah, May 20
- 1972 Fellow, The Utah Academy of Science, Arts, and Letters
- 1972 The American Chemical Society "Award for Creative Invention," Boston, Massachusetts, April 10
- 1971 Honorary Doctor of Science Degree, Brigham Young University, Commencement Exercises, Provo, Utah, May 28
- 1971 "Outstanding Manhood Award," presented by Associated Men Students, Brigham Young University, Provo, Utah April 13
- 1970-1973 Member of National Academy of Science--National Research Council Evaluation Panel for the National Bureau of Standards Heat Division
- 1970 Cortez Honors Lecture, Weber State University, December 10, Ogden, Utah
- 1970 American Institute of Chemist's "Chemical Pioneer Award," Pittsburgh, Pennsylvania, May 16
- 1968- Member of Joint Army-Navy-Air Force Thermochemical Tables Advisory Group
- 1967- Distinguished Professor of Chemistry and Chemical Engineering, Brigham Young University

- 1967 Robert A. Welch Foundation, "Lecturer in Chemistry," Texas Universities
- 1966-1969 Member of Editorial Board, "The Review of Scientific Instruments"
- 1965 The American Chemical Society, Salt Lake Section's "Utah Award," University of Utah, Salt Lake City, December 9
- 1965 The National Association of Manufacturer's "Modern Pioneers in Creative Industry Award," The Waldorf Astoria, New York City, December 2
- 1965 The Brigham Young University's "James E. Talmage Scientific Achievement Award," Baccalaureate Exercises, Provo, Utah, May 27
- 1964 Third Annual "Olin Mathesen Lecture," Yale University, New Haven, Connecticut, April 22
- 1964 First "Annual Faculty Lecture," Brigham Young University, Provo, Utah, April 8
- 1962 The American Society of Tool and Manufacturing Engineers "Research Medal," New York City
- 1961-1964 Member of Editorial Board, "Inorganic Chemistry"
- 1960-1961 President, Utah Academy of Sciences, Arts and Letters
- 1960 Fellow, American Association for the Advancement of Science
- 1959-1963 Alfred P. Sloan Foundation Research Fellow
- 1959 Chairman, Salt Lake Section, American Chemical Society
- 1954 First to synthesize diamond, December 16, G.E. Research Lab, Schenectady, New York