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Education

B.S. Geology and Mineralogy, The Pennsylvania State University, 1957
M.S. Geology, California Institute of Technology, 1959
Ph.D. Geochemistry, The Pennsylvania State University, 1963

Experience

1961-1962 Instructor, The Pennsylvania State University
1963-1967 Fellow, Geophysical Laboratory, Carnegie Institution of
Washington, Washington, D.C.
1967-1972 Assistant Professor, Southwest Center for Advanced Studies (which
became The University of Texas at Dallas in 1969)
1970 Geologist (visiting), U. S. Geological Survey, Menlo Park,
California (August)
1972-1978 Associate Professor, Department of Geosciences, The University of
Texas at Dallas
1976-1977 Visiting Associate Professor, Hawaii Institute of Geophysics,
University of Hawaii, Honolulu, Hawaii
1977 Geologist (visiting), U. S. Geological Survey, Menlo Park,
California (April-June)
1978-1999 Professor, Department of Geosciences, The University of Texas at
Dallas
1982-1985 Acting Director, Center for Lithospheric Studies, The University of
Texas at Dallas
1983-1984 Visiting scientist, U. S. Geological Survey, Reston, Virginia
1989 Visiting Professor, Department of Earth Sciences, State University
of New York at Stony Brook (January)
1989 Distinguished Visiting Professor, Department of Geology,
University of Alberta, Edmonton, Alberta, Canada (February-
May, August)
1996 Visiting Scholar, Institute for Study of the Earth's Interior, Okayama
University, Misasa, Japan (February-April)
1998 Visiting Scholar, Institute for Study of the Earth's Interior, Okayama
University, Misasa, Japan (September-November)
1999-present Emeritus Professor of Geology, University of Texas at Dallas
1999-2005 Visiting Scientist, Geophysical Laboratory, Carnegie Institution of
Washington

2006-2009 Visiting Scientist, Bayerisches Geoinstitut, Bayreuth, Germany, 3 months in 2006, 2 months in 2007 and 2008, 1 month in 2009.
2009 Visiting Scientist, University of Bristol, UK, 1 month

Memberships

American Geophysical Union (Fellow)
Geochemical Society
Geological Society of America (Fellow)
Indian Geophysical Union (Foreign Fellow)
Mineralogical Society of America (Fellow)

Activities

Convener, Chapman Conference (American Geophysical Union), Generation of the Oceanic Lithosphere, April 6-10, 1981.
Convener, First International Pressure Calibration Workshop, Misasa, Japan, 1997.
Editor, Journal of Geophysical Research, October, 1986-December, 1988.
Editor, Geophysics News, 1993.
Editorial Board, Science Letters, National Academy of Sciences of India, 1998-present.
EOS Associate Editor for Geophysics News, 1994-1995.
Edited volume: Plates, Plumes, and Paradigms (2005), edited by G. R. Foulger, J. H. Natland, D.C. Presnall, and D. L. Anderson, Spec. Paper 388, Geol. Soc. Am., 881 pp.
Member, Task Group on Geochemical Instrumentation, U.S. Geodynamics Committee of the National Research Council, 1988.
Member, Meetings Committee, American Geophysical Union, 1990-1992.
Member, Public Information Committee, American Geophysical Union, 1992-1994.
Member, Committee on Committees, Mineralogical Society of America, 1978-1980, 1991-1993.
Member, MSA Award Committee, Mineralogical Society of America, 1980-1981.
Mineralogical Society of America delegate to the Geological Society of America Joint Technical Program Committee, 1980-1983.
Member, Research Grant Committee, Mineralogical Society of America, 1987-1988.
Member, Macelwane Award Committee, American Geophysical Union, 1994-1996.
Member, Nominations Committee, Geochemical Society, 1997-2000; Chairman, 1999-2000.
Member, Roebling Medal Committee, Mineralogical Society of America, 1999-2000.
Member, Public Service Medal Committee, American Geophysical Union, 2006-2008.
Invited visit to Taiwan for presentation of two lectures, one at Academia Sinica in Taipei, and another at Chen Kong University in Tainan, 2010.
Invited paper at 2010 annual meeting of the American Geophysical Union, San Francisco, "Oceanic Volcanism from the Low-Velocity Zone – Without Mantle Plumes".

Publications

- Presnall, D. C. (1964) Deduction of liquid crystallization paths in a five-component oxide system containing iron, *Carnegie Institution of Washington Yearbook* 63, 133-135.
- Presnall, D. C. (1966) The join forsterite-diopside-iron oxide and its bearing on the crystallization of basaltic and ultramafic magmas, *Amer. Jour. Sci.*, **264**, 753-809.
- Presnall, D. C. (1967) compressibility isotherms of hydrogen at 200° and 300°C and pressures up to 1800 atmospheres, *Carnegie Institution of Washington Yearbook* 65, 415-418.
- Presnall, D. C. (1968) P-V-T measurements on hydrogen up to 600°C and 1800 atmospheres, *Carnegie Institution of Washington Yearbook* 66, 539-541.
- Presnall, D. C. (1969) Pressure-volume-temperature measurements on hydrogen from 200 to 600°C and up and to 1800 atmospheres, *J. Geophys. Res.*, **74**, 6026-6033.
- Presnall, D. C. (1969) The geometrical analysis of partial fusion, *Amer. Jour. Sci.*, **267**, 1178-1194.
- Presnall, D. C. (1971) Compressibility measurements of gases using externally heated pressure vessels, in G. C. Ulmer (ed.), *Research Techniques for High Pressure and High Temperature*, Chapter 9, 259-279, Springer-Verlag, Inc., New York.
- Presnall, D. C., C. L. Simmons, and H. Porath (1972) Changes in electrical conductivity of a synthetic basalt during melting, *J. Geophys. Res.*, **77**, 5665-5672.
- Presnall, D. C. and P. C. Bateman (1973) Fusion relations in the system NaAlSi₃O₈-CaAl₂Si₂O₈-KAlSi₃O₈-H₂O and generation of granitic magmas in the Sierra Nevada Batholith, *Geol. Soc. Am. Bull.*, **84**, 3181-3202.
- Presnall, D. C., N. L. Brenner and T. H. O'Donnell (1973) Drift of Pt/Pt10Rh and W3Re/W25Re thermocouples in single stage piston-cylinder apparatus, *Am. Mineral.*, **58**, 771-777.
- Presnall, D. C. and N. L. Brenner (1974) A method for studying iron silicate liquids under reducing conditions with negligible iron loss, *Geochim. Cosmochim. Acta*, **38**, 1785-1788.
- Chen, C.-H. and D. C. Presnall (1975) The system Mg₂SiO₄ at pressures up to 25 kbar, *Am. Mineral.*, **60**, 398-406.
- Presnall, D. C. (1976) Alumina content of enstatite as a geobarometer for plagioclase and spinel lherzolites, *Amer. Mineral.*, **61**, 582-588.
- Presnall, D. C., S. A. Dixon, J. R. Dixon, T. H. O'Donnell, N. L. Brenner, R. L. Schrock and D. W. Dycus (1978) Liquidus phase relations on the join diopside-forsterite-anorthite from 1 atm to 20 kbar; their bearing on the generation and crystallization of basaltic magma, *Contr. Mineral. Petrol.*, **66**, 203-220.
- Presnall, D. C., B. O. Mysen and I. Kushiro (1978) Correction to the paper "Compositional variations of coexisting phases with degree of melting of peridotite in the upper mantle" by B. O. Mysen and I. Kushiro, *Amer. Mineral.*, **63**, 597.
- Presnall, D. C. (1979) Fractional crystallization and partial fusion, in H. S. Yoder, Jr. (ed.), *The Evolution of the Igneous Rocks, Fiftieth Anniversary Perspectives*, Princeton University Press, 59-75.
- Presnall, D. C., J. R. Dixon, T. H. O'Donnell and S. A. Dixon (1979) Generation of mid-ocean ridge tholeiites, *J. Petrology*, **20**, 3-35.
- O'Donnell, T. H. and D. C. Presnall (1980) Chemical variations of the glass and mineral phases in basalts dredged from 25° - 30°N along the Mid-Atlantic Ridge, *Amer. Jour. Sci.*, **Jackson Vol. 280-A**, 845-868.

- Presnall, D. C. (1980) A double partial melt zone in the mantle beneath mid-ocean ridges, *Phys. Earth Planet. Int.*, **23**, 103-111.
- Wyllie, P.J., C. H. Donaldson, A. J. Irving, S. E. Kesson, R. B. Merrill, D. C. Presnall, E.M. Stolper, T. M. Usselman and D. Walker (1982) Experimental petrology of basalts and their source rocks, Chapter 3 of *Basaltic Volcanism on the Terrestrial Planets*, Pergamon Press, New York.
- Presnall, D. C. and C. E. Helsley (1982) Diapirism of depleted peridotite - a model for the origin of hot spots, *Phys. Earth Planet. Int.*, **29**, 148-160.
- Presnall, D. C. (1982) Comments on "MORB - a mohole misbegotten?" by M. J. O'Hara, *Trans. Am. Geoph. Union*, **63**, 1210.
- Sen, G., and D. C. Presnall (1984) Liquidus phase relations on the join anorthite-forsterite-quartz at 10 kbar with applications to basalt petrogenesis, *Contr. Mineral. Petrol.*, **85**, 404-408.
- Presnall, D. C. and J. D. Hoover (1984) Composition and depth of origin of primary mid-ocean ridge basalts, *Contr. Mineral. Petrol.*, **87**, 170-178.
- Sen, G. and D. C. Presnall (1986) Petrogenesis of dunite xenoliths from Koolau Volcano, Oahu, Hawaii: Implications for Hawaiian volcanism, *J. Petrology*, **27**, 194-217.
- Presnall, D. C. (1986) An algebraic method for determining equilibrium crystallization and fusion paths in multicomponent systems, *Am. Mineral.*, **71**, 1061-1070.
- Presnall, D. C. and J. D. Hoover (1986) Composition and depth of origin of primary mid-ocean ridge basalts - reply to D. Elthon, *Contr. Mineral. Petrol.*, **94**, 257-261.
- Presnall, D. C. and J. D. Hoover (1987) High pressure phase equilibrium constraints on the origin of mid-ocean ridge basalts, *Geochem. Soc., Spec. Paper No. 1*, 75-89.
- Liu, T.-C. and D. C. Presnall (1989) The diopside-tridymite liquidus boundary line in the system Mg_2SiO_4 - $CaMgSi_2O_6$ - SiO_2 at atmospheric pressure, *Am. Mineral.*, **74**, 1032-1037.
- Liu, T.-C. and D. C. Presnall (1990) Liquidus phase relationships on the join anorthite-forsterite-quartz at 20 kbar with applications to basalt petrogenesis and igneous sapphirine, *Contr. Mineral. Petrol.*, **104**, 735-742.
- Presnall, D. C. and T. Gasparik (1990) Melting of enstatite from 10 to 16.5 GPa and the forsterite-majorite eutectic at 16.5 GPa: Implications for the origin of the mantle, *J. Geophys. Res.*, **95**, 15,771-15,777.
- Presnall, D. C. (1991) Algebraic methods for determining directions of decreasing temperature along isobaric liquidus univariant lines, *Canadian Mineral.*, **29**, 687-692.
- Chen, C.-H., D. C. Presnall and R. J. Stern (1992) Petrogenesis of ultramafic xenoliths from the 1800 Kaupulehu flow, Hualalai Volcano, Hawaii, *J. Petrol.*, **33**, 163-202.
- Presnall, D. C. and M. J. Walter (1993) Melting of forsterite, Mg_2SiO_4 , from 9.7 to 16.5 GPa, *J. Geophys. Res.*, **98**, 19,777-19,783.
- Walter, M. J. and D. C. Presnall (1994) Melting behavior of simplified lherzolite in the system CaO - MgO - Al_2O_3 - SiO_2 - Na_2O from 7 to 35 Kbar, *J. Petrol.*, **35**, 329-359.
- Presnall, D. C. (1995) Phase diagrams of Earth-forming minerals, in Ahrens, T. J. (ed.) *Handbook of Physical Constants, Mineral Physics and Crystallography*, Am. Geophys. Union, Washington, D.C.

- Walter, M. J., T. W. Sisson and D. C. Presnall (1995) A mass proportion method for calculating melting reactions and application to melting of model upper mantle lherzolite, *Earth Planet. Sci. Lett.*, **135**, 77-90.
- Gudfinnsson, G. H. and Presnall, D. C. (1996) Melting relations of model lherzolite in the system CaO-MgO-Al₂O₃-SiO₂ at 2.4-3.4 GPa and the generation of komatiites, *J. Geophys. Res.*, **101**, 27,701-27,709.
- Dalton, J. A. and Presnall, D. C. (1997) No liquid immiscibility in the system MgSiO₃-SiO₂ at 5 GPa, *Geochim. Cosmochim. Acta*, **61**, 2367-2373..
- Milholland, C. S. and Presnall, D. C. (1998) Liquidus phase relations in the CaO-MgO-Al₂O₃-SiO₂ system at 3.0 GPa: The aluminous pyroxene thermal divide and high pressure fractionation of picritic and komatiitic magmas, *J. Petrology*, **39**, 3-27.
- Dalton, J. A. and Presnall, D. C. (1998) Carbonatitic melts along the solidus of model lherzolite in the system CaO-MgO-Al₂O₃-SiO₂-CO₂ from 3 to 7 GPa, *Contrib. Mineral. Petrol.*, **131**, 123-135.
- Presnall, D. C., Weng, Y.-H., Milholland, C. S. and Walter, M. J. (1998) Liquidus phase relations in the system MgO-MgSiO₃ at pressures up to 25 GPa — Constraints on crystallization of a molten Hadean mantle, *Phys. Earth Planet. Int.*, **107**, 83-95.
- Presnall, D. C. (1998) Crystallization of a Hadean terrestrial magma ocean, *National Acad. Sci. Lett.*, **21**, 99-109, National Acad. Sci. India.
- Dalton, J. A. and Presnall, D. C. (1998) The continuum of primary carbonatitic-kimberlitic melt compositions in equilibrium with lherzolite: Data from the system CaO-MgO-Al₂O₃-SiO₂-CO₂ at 6 GPa, *J. Petrol.*, **39**, 1953-1964.
- Presnall, D. C. (1999) Effect of pressure on the fractional crystallization of basaltic magma, In Fei, Y., Bertka, C. B., and Mysen, B. O. (eds.) *Mantle Petrology: Field Observations and High-Pressure Experimentation, Special Pub. 6*, Geochem. Soc., 209-224, Houston.
- Liu, T.-C., and Presnall, D. C. (2000) Liquidus phase relations in the system CaO-MgO-Al₂O₃-SiO₂ at 2.0 GPa: Applications to basalt fractionation, eclogites, and igneous sapphirine, *J. Petrol.*, **41**, 3-20.
- Gudfinnsson, G. H. and Presnall, D. C. (2000) Melting behavior of model lherzolite in the system CaO-MgO-Al₂O₃-SiO₂-FeO at 0.7 to 2.8 GPa, *J. Petrol.*, **41**, 1241-1269.
- Weng, Y.-H. and Presnall, D. C. (2001) The system diopside-forsterite-enstatite at 5.1 GPa: A ternary model for melting of the mantle, *Canadian Mineral.*, **39**, 299-308.
- Gudfinnsson, G. H. and Presnall, D. C. (2001) A pressure-independent geothermometer for primitive mantle melts, *J. Geophys. Res.*, **106**, 16,205-16,211.
- Presnall, D. C., Gudfinnsson, G. H., and Walter, M. J. (2002) Generation of mid-ocean ridge basalts at pressures from 1 to 7 GPa, *Geochim. Cosmochim. Acta*, **66**, 2073-2090.
- Presnall, D. C. and Gudfinnsson, G. H. (2005) Carbonate-rich melts in the oceanic low-velocity zone and deep mantle, in Foulger, G. R., Natland, J. H., Presnall, D. C., and Anderson, D. L. (eds.), *Plates, Plumes and Paradigms*, Geol. Soc. Am. Spec. Paper 388, 207-216.
- Gudfinnsson, G. H., and Presnall, D. C. (2005) Continuous gradations among primary carbonatitic, kimberlitic, melilititic, basaltic, picritic, and komatiitic melts in equilibrium with garnet lherzolite at 3-8 GPa, *J. Petrol.*, **46**, 1645-1659.

- Keshav, S., Sen, G. H., and Presnall, D. C. (2007) Garnet-bearing xenoliths from Salt Lake Crater, Oahu, Hawaii: High-pressure fractional crystallization in the oceanic mantle., *J. Petrol.*, **48**, 1681-1724.
- Presnall, D. C. and Gudfinnsson, G. H. (2008) Origin of the oceanic lithosphere, *J. Petrol.*, **72**, 615-632.
- Presnall, D. C. and Gudfinnsson, G. H. (2011) Fracture-Induced Oceanic volcanism from the low-velocity zone – without mantle plumes, *J. Petrol.*, **P. J. Wyllie Volume** (advanced access).
- Keshav, S., Gudfinnsson, G. H., and Presnall, D. C. (2011) Melting phase relations of simplified carbonated peridotite at 12-26 GPa in the systems CaO-MgO-SiO₂- and CaO-MgO-Al₂O₃-SiO₂-CO₂: Highly calcic magmas in the transition zone of the Earth, *Jour. Petrology*, **52**, 2265-2291.