

Needs and opportunities in mineral evolution research

**ROBERT M. HAZEN,^{1,*} ANDREY BEKKER,² DAVID L. BISH,³ WOUTER BLEEKER,⁴ ROBERT T. DOWNS,⁵
JAMES FARQUHAR,⁶ JOHN M. FERRY,⁷ EDWARD S. GREW,⁸ ANDREW H. KNOLL,⁹ DOMINIC PAPINEAU,¹⁰
JOLYON P. RALPH,¹¹ DIMITRI A. SVERJENSKY,⁷ AND JOHN W. VALLEY¹²**

¹Geophysical Laboratory, Carnegie Institution of Washington, 5251 Broad Branch Road NW, Washington, D.C. 20015, U.S.A.

²Department of Geological Sciences, University of Manitoba, Winnipeg, Manitoba R3T 2N2, Canada

³Department of Geological Sciences, Indiana University, 1001 E. 10th Street, Bloomington, Indiana 47405, U.S.A.

⁴Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8, Canada

⁵Department of Geosciences, University of Arizona, 1040 East 4th Street, Tucson, Arizona 85721-0077, U.S.A.

⁶Department of Geology and ESSIC, University of Maryland, College Park, Maryland 20742, U.S.A.

⁷Department of Earth and Planetary Sciences, Johns Hopkins University, Baltimore, Maryland 21218, U.S.A.

⁸Department of Earth Sciences, University of Maine, Orono, Maine 04469, U.S.A.

⁹Department of Organismic and Evolutionary Biology, Harvard University, Cambridge, Massachusetts 02138, U.S.A.

¹⁰Department of Earth and Environmental Sciences, Boston College, Chestnut Hill, Massachusetts 02467, U.S.A.

¹¹mindat.org, 81 Woodcote Grove Road, Coulsdon, Surrey CR5 2AL, U.K.

¹²Department of Geoscience, University of Wisconsin, Madison, Wisconsin 53706, U.S.A.

ABSTRACT

Progress in understanding mineral evolution, Earth's changing near-surface mineralogy through time, depends on the availability of detailed information on mineral localities of known ages and geologic settings. A comprehensive database including this information, employing the mindat.org web site as a platform, is now being implemented. This resource will incorporate software to correlate a range of mineral occurrences and properties vs. time, and it will thus facilitate studies of the changing diversity, distribution, associations, and characteristics of individual minerals as well as mineral groups. The Mineral Evolution Database thus holds the prospect of revealing mineralogical records of important geophysical, geochemical, and biological events in Earth history.

Keywords: Philosophy of mineralogy, database, isotope geochemistry, origins of life, mineral data