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Determination of the Mineralogy of the Magnetic Dust on Mars and Implications for the History of Water on Mars.

K. Leer (1), P. Bertelsen (1), C. S. Binau (1), F. Folkmann (2), W. Goetz (3), H. P. Gunnlaugsson (2), S. F. Hviid (3), K. M. Kinch (4), M. B. Madsen (1), J. Merrison (2), M. Olsen (3), R. Gellert (5), G. Klingelhöfer (5), and the Athena Science team

(1) Niels Bohr Institute, University of Copenhagen, Denmark

(2) Mars Simulation Laboratory, Universtiy of Aarhus, Denmark

(3) Max-Planck-Institut, Katlenburg-Lindau, Germany

(4) Department of Astronomy, Cornell University, NY, USA

(5) Institut fur Anorganische und Analytische Chemie, J. Gutenberg Universität, Mainz, Germany

We report on determination of the mineralogy of atmospherically suspended Martian dust particles using backscattering ^{57}Fe Mössbauer spectroscopy and APXS elemental analysis on the Mars Exploration Rovers on dust accumulated onto some of the onboard magnets.

The Mössbauer spectra can be interpreted in terms of minerals of igneous origin, and shows only minor, if any, amounts of secondary minerals that may have formed in the presence of liquid water.

The elemental composition is found to bear similarities to that of soil, with some distinctive differences that are related to the characteristics of the magnetic minerals and may have implications for the dust formation processes.

The results are compared to simulation studies performed on analogue materials. These support the suggestion that the dust has formed in a dry environment over a very long time in the history of Mars.