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Three-year POSTDOC position Mineralogy and Crystallography University of Vienna, Austria

Candidates with a PhD in mineralogy, crystallography, experimental petrology, solid state physics or chemistry are invited to apply for a three-year postdoc position on "Phase Transitions in Lawsonite-Type Minerals", starting in June 2011 at the University of Vienna, Austria. Individuals with experience in high-pressure synthesis, diffraction techniques (X-ray, neutron, synchrotron), and vibrational spectroscopy are preferred. Basic knowledge of German language and fluent written and spoken English are a must. Beyond the stimulating atmosphere at renowned and well-equipped institutes in Vienna/A and GFZ Potsdam/D (for high-pressure syntheses), a competitive salary according to the rates of the FWF Austria (www.fwf.ac.at), and the charm of a modern European capital are offered.

Your electronic application (including CV, publication list, and contact information of three references) to eugen.libowitzky@univie.ac.at is accepted until April 30th, 2011.

Eugen Libowitzky

FWF Project P23108-N19 Abstract

"Phase Transitions in Lawsonite-Type Minerals"

Lawsonite, $\text{CaAl}_2(\text{Si}_2\text{O}_7)(\text{OH})_2 \cdot \text{H}_2\text{O}$, is an orthorhombic high-pressure silicate mineral that shows two phase transitions from dynamic disorder of H_2O and OH groups at ambient temperature to structural order and an enhanced hydrogen bond system at low temperatures. In addition, a high-pressure phase transition has been observed. In recent years, a number of isotypic minerals and synthetic compounds with Sr, Ba, and Pb substituting for Ca, and Mn^{3+} for Al, have been discovered. Only hennomartinite, $\text{SrMn}_2(\text{Si}_2\text{O}_7)(\text{OH})_2 \cdot \text{H}_2\text{O}$, has been confirmed to show similar order-disorder phase transitions, the other compounds remained unexplored. Thus, the present project aims at an investigation of the phase transitions in endmembers and solid-solution series of the lawsonite group, to understand the influence of changing composition, lattice parameters, bond distances, and structural distortions on critical parameters of the transitions (temperature, pressure, evolution of the order parameter, *etc.*).

To accomplish these tasks, a number of methods will be combined. (i) Samples will be synthesized in high-pressure equipment such as piston-cylinder / multi-anvil devices at GFZ Potsdam, Germany (~ 30 days per year). (ii) The obtained crystals will be inspected by scanning electron microscopy and characterized by chemical micro-analysis. (iii) X-ray structure analysis on single-crystals and/or powders will reveal lattice parameters and information on the bulk structure (long-range order). Vibrational spectroscopy techniques such as (iv) confocal micro-Raman and (v) Fourier-transform infrared spectroscopy will provide details of short-range order, structure dynamics, and hydrogen bonding. (vi) Measurement of various physical parameters vs. temperature such as heat flow, birefringence, *etc.* will yield the exact transition temperatures and the energetic evolution of the phase transitions and their order parameters. (vii) Diffraction and spectroscopy at neutron and synchrotron beam lines, as well as experiments at elevated pressure are optional.