Minerals

PS08.02.01 RIETVELD-REFINEMENTS AND TEMPERATURE-DEPENDENT MOESSBAUER SPECTROSCOPIC INVESTIGATIONS OF SYNTHETIC C2/e CLINOPYROXENES. G. Anthaier, G. J. Redhammer, W. Lottermoser, Institute of Mineralogy, University of Salzburg, Austria

C2/e clinopyroxenes on the hibonite join hedenbergite (MgSi2O6) and FeSiO3-acmite NaFe3Si3O10 were synthesized using standard hydrothermal techniques and investigated by means of temperature-dependent Moessbauer spectroscopy. The spectra were deconvoluted using standard Rietveld methods, and the results were refined using the Rietveld software DREMIN. The final agreement factors were Rwp = 0.06 and Rf = 0.05.

PS08.02.02 SPINEL FORMATION IN THE MESOSPHERE OF THE EARTH AFTER CRETACEOUS/TERTIARY IMPACT. S. Aslanian, A. Preisinger and L. Petris, Institute of Mineralogy, Crystallography and Structural Chemistry, Tech. University of Vienna, A-1060 Vienna, Geidezeidnig 9, AUSTRIA.

Magnetic spinels separated from hemipelagic and pelagic sediments of the Cretaceous/Tertiary (K/T) boundary sections of Bjala, Bulgaria and Cerbara, Italy were analysed by X-ray powder diffraction and by scanning electron microscope equipped with microprobe. The spinels were found to be the dominant magnetic phase in the sediments.

PS08.02.03 STRUCTURAL VARIATIONS IN THE ZEOLITE PAULINGITE. A. Bienio, W. Joswig and W. H. Baur, Univ. Frankfurt, Institut f. Kristallographie, Senckenbernglanke 30, 60054 Frankfurt, Germany.

The Ca- and Ba-rich forms of paulingite were studied by X-ray single crystal methods. The refinements1 converged to R = 0.085 and 0.077. This is the first structural information on chemically different paulingite crystals since introducing this natural zeolite and its complicated aluminosilicate crystal structure in 1966. Paulingite is a medium pore size zeolite constructed from 7 different cages (op1, grc, hcp, pga, cpa, ota, gui). The access to all cages is controlled by plane or defomed single eight rings (SRR). Preferred cation sites are the saddle shaped SRR openings from the open double eight rings (oto) to the para cages (K1) and the compressed para cages (cpa) (Bal. K2). Two strong bonds to framework oxygen atoms and four to water molecules are possible at this site. The pga cages are stuffed by Ca cations coordinated by eight water molecules. An additional cation position occupied by K is located in the big channel of the structure in the SRR connecting the 2 large rhombicuboctahedron (goc) with a double eight ring (opr). All other cages are stuffed with highly disordered and weakly bonded water molecules. The Si and Al atoms (ratio 2.9) are statistically distributed over 8 different T sites. The individual T-O distances of 1.64 ± 0.01 A (A) and (±0.02 A), and the T-O-T angles of 146° (±3°) and 145° (±3°) respectively, show that the different cation populations in the pores do not affect the geometry of the framework of paulingite appreciably. The narrow distribution of the T-O-T angles shows that the framework is relaxed compared with the wide range of T-O-T angles observed in zeolites at large (16° to 180°).

PS08.02.04 THE INTERMEDIATE MEMBERS OF WAGNERITE-ZWIESELITE MINERAL SERIES. Dimitriea M.T., Fin'ko V.I., IGEM Russian Acad.Sci. Staramonometnny 35 Moscow Zh-17 109017 Russia.

The X-ray diffraction study of two ferroan wagnerite samples from Kyakhta (Russia) have been carried out with the intention to clarify the crystallochemical relationship between rather rare minerals: wagnerite Mg2FePO4, ferro wagnerite (Mg,Fe)2FePO4, tripodite (Mn,Fe)3PO4, magnetiopilite (Mn,Fe)2Fe2PO4 and zwieselite Fe2PO4. In spite of the fact that all these minerals are characterized by the same general formula Mg2PO4(OH), where M = Mg2+, Fe2+, Fe3+, Mn3+ the crystal structure data reported by different authors have not shown the identity of all these minerals. According to the chemical composition the two ferroan wagnerite (Mg1.75Fe0.25Si2O7) and (Mg2.17Fe0.24Mn0.12)PO4 are the intermediate members of wagnerite-zwieselite series. The long exposure experiment of the ferroan wagnerite permitted to register the faint reflections at low angle area, which had not been observed by previous studies and the conclusion was made, that the ferroan wagnerite distinguishes from wagnerite and is identical with magnetiopilite. This study showed that namely these samples belong to the wagnerite group rather than to magnetiopilite.