Abstract Submission

OL05_4

T4 - The dynamical world of minerals
Spectroscopic methods applied to mineralogy

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Mn-rich layered silicates identification with Raman spectroscopy
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Abstract Content: Mn-rich layered silicates structurally related to stilpnomelane are numerous (armbrusterite, bannisterite, eggletonite, ganophyllite, lennilenapeite, middendorfite, parsettensite, tamaite, and franklinphilite), have some similar features in chemistry and X-ray crystallography and rarely form perfect single crystals. As a result, their reliable identification is, in common case, not so easy. As our data show, Raman spectroscopy is good and the most express diagnostic tool for these minerals. However, to date only the Raman spectrum of stilpnomelane was published (*Kuebler, 2013*). We obtained the X-ray diffraction patterns, chemical data and Raman spectra of bannisterite, ganophyllite, middendorfite (from type localities), parsettensite (structurally confirmed) and compared them with stilpnomelane. The Raman spectra (Fig 1) can be divided into two groups according to the "fingerprint" region: bannisterite and stilpnomelane are characterized by one intense band near 600 cm^{-1} while ganophyllite, parsettensite and middendorfite by a set of three bands of similar intensity (400-650 cm^{-1}). The position of these bands determined by the layered structure of silicates (Si–O–Si bonds) (*Wang et al., 2015*). Besides, parsettensite and bannisterite show additional bands in the region of H_2O stretching vibrations (3500-3700 cm^{-1}).

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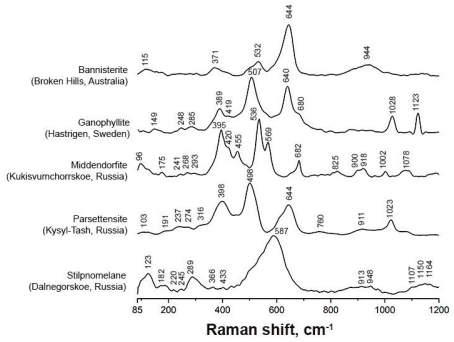
Fig. 1. Raman spectra of stilpnomelane-related minerals

Image:



References: *Kuebler K.E.* (2013) A combined electron microprobe (EMP) and Raman spectroscopic study of the alteration products in Martian meteorite MIL 03346 // J. of Geophysical Research: Planets. Vol. 118. PP. 347 – 368.