A COMPREHENSIVE INFRARED DATABASE TO RECOGNIZE THE WATER CONTENT OF MINERALS: PANNON UNIFORM LITHOSPHERIC INFRARED SPECTRAL DATABASE (PULI)

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Over the last decades several papers and books, dealing with various aspects of water content of minerals by Fourier transform infrared spectroscopy, have been worldwide published. Advancements in technology and methods have resulted in an explosion of mineral infrared spectroscopy (PATERSON, 1982; LIBOWITZKY & ROSSMAN, 1996; SAMBRIGE *et al*., 2008, KOVÁCS *et al*., 2010). To keep up with this exponentially rising knowledge in infrared spectroscopy of minerals, an electronic spectral database was needed. This can assist us in understanding better both the qualitative and quantitative aspects of incorporation in minerals structures, and this could provide a reference for the interpretation of future infrared analysis of minerals.

This is the reason why we construct the Pannon Uniform Lithospheric Infrared (PULI) Spectral Database, which would include large amount of infrared spectra of nominally anhydrous silicate minerals (olivine, pyroxenes, garnet), diamonds and clay minerals. This is because there is internationally a great demand for a thematic reference spectral database, where the absorption bands of water incorporated in different minerals are summarized in a uniform format, which may be also suitable for quantitative re-evaluation.

Fundamentals of our analytical setup (i.e. sample preparation, microscope settings) and evaluation protocol (i.e. background subtraction, integration and calibration factors) results of the re-evaluation for upper mantle and experimentally derived olivine spectra are presented, which contribute to recognition of water content in the Earth's mantle and the multiple role of water in mantle processes. Furthermore, we tested a standard olivine by different infrared spectroscopy instruments to provide us clear and objective instructions regarding the analytical settings and spectrum evaluation. Such a spectral comparison has not been previously critically performed.

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