

## THE RAMAN STUDY ON CERTAIN SULFATES

NICOLAE BUZGAR<sup>1</sup>, ANDREI BUZATU<sup>1</sup>, IOAN VASILE SANISLAV<sup>2</sup>

<sup>1</sup> „Al.I.Cuza” University of Iași, Department of Geology, 20A Carol I Blv., 700505 Iași,  
Romania

<sup>2</sup> School of Earth and Environmental Sciences, James Cook University, Townsville, QLD  
4811, Australia

### Abstract

Some of the most common sulfates have been investigated by non-contact Raman spectrography. For barite and anhydrite group the vibrational mode  $\nu_1$  decreases as the atomic mass increases. The Raman spectrum of chalcocyanite shows two strong bands at  $1013\text{ cm}^{-1}$  and  $1045\text{ cm}^{-1}$  interpreted as  $\nu_1$  modes. The bands at  $423\text{ cm}^{-1}$ ,  $448\text{ cm}^{-1}$ ,  $480\text{ cm}^{-1}$  and  $514\text{ cm}^{-1}$  have been assigned to the  $\nu_2$  sulfate mode, the bands at  $1101\text{ cm}^{-1}$  and  $1205\text{ cm}^{-1}$  to the  $\nu_3$  vibrational modes and the bands at  $622\text{ cm}^{-1}$  and  $670\text{ cm}^{-1}$  to the  $\nu_4$  mode of  $\text{SO}_4$ . The bands at  $250\text{ cm}^{-1}$ ,  $269\text{ cm}^{-1}$  and  $347\text{ cm}^{-1}$  have been interpreted as vibrations of Cu-O bonds. Szmikite shows intense vibrations at  $1021\text{ cm}^{-1}$  interpreted as  $\nu_1$  mode of  $\text{SO}_4$ . The  $\nu_2$  and  $\nu_3$  modes the bands are at  $425\text{ cm}^{-1}$  and  $493\text{ cm}^{-1}$  respectively  $1089\text{ cm}^{-1}$  and  $1189\text{ cm}^{-1}$ . The bands at  $623\text{ cm}^{-1}$  and  $654\text{ cm}^{-1}$  were assigned to the  $\nu_4$  mode. The translational mode T( $\text{H}_2\text{O}$ , Mn) was determined at  $263\text{ cm}^{-1}$ .

**Key words:** Raman spectra, sulfates, chalcocyanite, szmikite

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<sup>1</sup> e-mail: nicolae.buzgar@uaic.ro