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A novel data on Ag₅SbS₄ and CuPbSbS₃ probed by antimony NQR spectroscopy

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Abstract

Investigations of Sb-based chalcogenides, stephanite Ag₅SbS₄ and bournonite CuPbSbS₃, have been performed by ^{121,123}Sb nuclear quadrupole resonance (NQR). In stephanite a phase transition at 140 K and internal diffusion motions with an activation energy of 0.29 eV have been experimentally detected. The analysis of experimental results for bournonite revealed two crystal-chemical positions of Sb in the unit cell with distinct local symmetry. The NQR frequencies ν and line-widths $\Delta\nu$ data indicate that Sb(A)S₃ complex has almost axial symmetry, but Sb(B)S₃ complex is substantially distorted.

Keywords

Bournonite, Chalcogenides, Crystal chemistry, NQR spectroscopy, Stephanite, Transport properties