$Rb_2P_2S_6$ – A New Alkali Thiophosphate: Crystal Structure and Vibrational Spectra of Rubidium Hexathiodiphosphate(V)

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Single crystals of rubidium hexathiodiphosphate(V), $Rb_2P_2S_6$, have been obtained and investigated by single crystal X-ray diffraction, and IR/FIR and Raman spectroscopy. The title compound crystallizes isotypically to the potassium, caesium and thallium analogues in the orthorhombic space group *Immm* (no. 71) with $a = 8.485(3)$, $b = 6.953(3)$, $c = 9.259(3)$ Å, and $Z = 2$, final $R1 = 0.0579$ and $wR2 = 0.0987$. The crystal structure is characterized by discrete $[P_2S_6]^{2-}$ anions (edge-sharing double-tetrahedra) with D_{2h} symmetry. Rubidium is coordinated by ten sulfur atoms forming a slightly distorted two-capped tetragonal prism with a coordination number CN_{Rb} 10. The FT-Raman and FT-IR/FIR spectra have been recorded and a factor group analysis was carried out.

Key words: Thiophosphate, $Rb_2P_2S_6$, Crystal Structure, Raman, IR