Preparation and Crystal Structure of Hexapotassium-μ-oxo-hexathiodititanate(IV), $K_6Ti_2OS_6$

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Pale yellow crystals of the title compound were obtained by reacting an intimate mixture of K_2S, $K_2S_2O_4$, Ti and S at 650 °C. $K_6Ti_2OS_6$ is monoclinic, *mP*60, s. g. $P2_1/c$. It is characterized by the formation of bitetrahedral complex anions, $[S_3TiOTiS_3]^{6-}$, which adopt a staggered conformation. The mean Ti-S and Ti-O bond lengths are 2.242(1) and 1.836(2) Å, respectively, the Ti-O-Ti bond angle is 153.8(2)°. Two K^+ ions complete the coordination of the bridging oxygen atom by the cations to a heavily distorted tetrahedral configuration. The anions are arranged in corrugated slabs running parallel to (100). The packing and crystallographic relationship to $K_6Co_2O_7$ are discussed.

Key words: Chalcogenides, Titanium, Complex Oxysulfides