

混合原子価POM単結晶の電気伝導度に及ぼす クラスター間距離依存性

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Inter-cluster distance dependence of electrical properties in single crystals of a mixed-valence polyoxometalate

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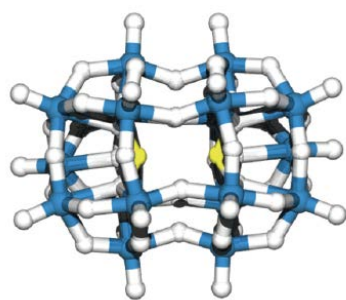


Figure 1. Structure of the cluster anion $[\text{Mo}^{\text{V}}_2\text{Mo}^{\text{VI}}_{16}\text{O}_{54}(\text{SO}_3)_2]^{6-}$ with balls colored blue (Mo), white (O) and yellow (S).

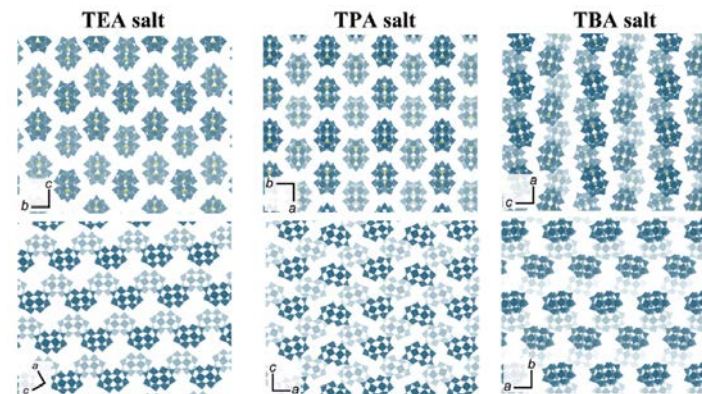


Figure 2. Packing structure (polyhedral model with Mo (blue) and S (yellow)).

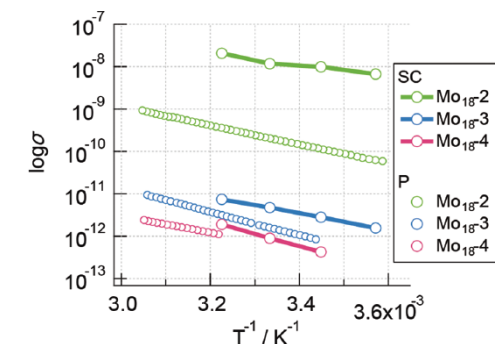


Figure 3. Arrhenius plots of conductivity σ (S cm^{-1}) measured with single crystal (SC) and powder pellet (P).

混合原子価POMの電気伝導性のクラスター間距離依存性を評価し、カウンターカチオンのサイズにより制御した。単結晶の電気伝導性は、温度とアルキルアンモニウムの鎖長に依存した。混合原子価POMクラスターは、結晶内で高次ネットワーク構造が拡張した分子性のモリブデンブロンズ粒子と考えられる。

The electrical conductivity of mixed-valence POM salts was investigated through dependence on the inter-cluster distance that is controlled by tetraethylammonium, tetrapropylammonium, and tetrabutylammonium cations. The electrical conductivities of the single crystals were found to be dependent on both temperature and chain length. Mixed-valence POM clusters are considered to be a molecular particle of Mo bronze by which highly ordered networks will be developed using single crystals.