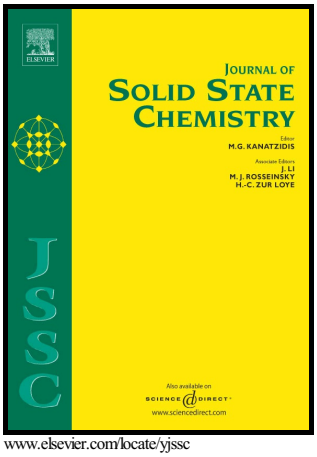

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Synthesis, Crystal Structure and High-Temperature Transport Properties of the New Cluster Compound $Rb_2Mo_{15}Se_{19}$

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Abstract

We report on the synthesis, crystal structure and high-temperature transport properties of $Rb_2Mo_{15}Se_{19}$, a new member of the large family of $M_2Mo_{15}Se_{19}$ (M = In, Tl, K, Ba) cluster compounds. Polycrystalline samples and single crystals of the ternary selenide $Rb_2Mo_{15}Se_{19}$ were obtained by solid-state reactions. The trigonal crystal structure, successfully refined in space group $R\bar{3}c$ (No. 167) with unit-cell parameters a = 9.7618(1) Å, c = 58.254(1) Å and Z = 6, was determined by single-crystal X-ray diffraction. The crystal structure contains $Mo_6Se_8{}^{i}Se_6{}^{a}$ and $Mo_9Se_{11}{}^{i}Se_6{}^{a}$ cluster units in equal proportion and separated from each other by large voids, which are filled up by Rb atoms. Measurements of the electrical resistivity, thermopower and thermal conductivity revealed that $Rb_2Mo_{15}Se_{19}$ behaves as a *p*-type metal with relatively low electrical resistivity and thermopower. Despite its complex crystal