

Electronic transport properties of VS₄ under high pressures

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Transition metal chalcogenides are actively synthesized and investigated because of their enormous technological potential. [1,2]. The transition metal dichalcogenides are well studied, the trichalcogenides are comparatively less studied. Vanadium tetrasulfide (VS₄) remained poorly studied due to difficulties of its synthesis. VS₄ is a semiconductor with a band gap of ~ 0.8-1.35 eV [3-4], and hence, its physical properties and high-pressure effects on them are of considerable interest.

In the present work, we have synthesized single-crystals of vanadium tetrasulfide (VS₄) and investigated its electronic transport properties under high pressure up to 10 GPa. We found that the absolute value of the thermopower and electrical resistivity dramatically

diminished with pressure, thereby suggesting a gradual closure of its semiconductor band gap.

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