



## Molecular Crystals and Liquid Crystals

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### Pseudoternary Chevrel Phases: H<sub>x</sub>Mo<sub>6</sub>S<sub>6</sub>X<sub>2</sub> (X = Br, I).

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PSUDOTERNARY CHEVREL PHASES:  $M Mo_6 S_8 X_2$  ( $X = Br, I$ ).  
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The series of ternary molybdenum sulfides,  $M Mo_6 S_8$ , first prepared by R. Chevrel, exhibits a fascinating set of physical properties. These compounds generally are superconductors with  $T_c$  values approaching 15 K, and with high critical fields and critical current densities. Several of the rare earth compounds are magnetic superconductors. These systems display features (relatively high transition temperatures and very high critical fields) necessary for technological applications as superconductors, as well as hitherto unobserved physical behavior that has led to new insights into the physics of superconducting and magnetic materials.

We wish to report the preparation and structural characterization of the pseudo-ternary systems  $M Mo_6 S_6 X_2$  ( $M = Li, Cr, Co, Cu, Zn, X = Br, I$ ) in which the halogen atoms replace two sulfur atoms in the  $Mo_6 S_8$  clusters present in Chevrel phases. The systems are isomorphous and structurally similar to the ternary sulfides, but the presence of the halogen atoms changes the distribution of M counter ions in the lattice.  $Li_2 Mo_6 S_6 I_2$  reacts with acid giving  $H Mo_6 S_6 I_2$ , a nonsuperconducting material which is isostructural with  $Mo_6 S_6 I_2$  which has a  $T_c$  of 12 K.