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Search for chalcogenide based superconductors: Sulfur based solution growth[1] UDHARA KALUARACHCHI, SERGEY BUD'KO, PAUL CANFIELD, Department of Physics, Iowa State University — As part of our effort to develop tools for searching for new chalcogenide based superconductors we are expanding the range of S-based binary melts that we can use for solution growth of single crystals. As a recent example, we have been able to grow single crystals of $Rh_{17}S_{15}$ and separate them for excess binary melt via high temperature decanting. In addition to refining the details of the Rh-S binary phase diagram, microscopic, thermodynamic and transport measurement on $Rh_{17}S_{15}$ crystals confirm their $T_c \sim 5.5$ K as well as their remarkably large H_{c2}(T) behavior. The possible cause of the enhanced H_{c2}(T) will be discussed. As time allows we will also review other S-based growths and compounds.

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