

## Growth of single crystals in material research

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The subject of this work was an optimization of the single crystal growth of various materials. Various single crystal growth methods such as Flux, Bridgman, Czochralski, Floating zone and Chemical vapour transport were tested on materials of various classes. The most stressed materials are heavy fermion semiconductors  $U_3T_3X_4$  where T is a transition metal  $T = Ni, Pd$  and  $Pt$  and  $X = Sb$  or  $Bi$  as well as  $Ce_3Al_{11}$ . Other materials discussed in this work are semimetallic material  $U_2Ru_2Sn$ , ferromagnetic superconductor  $UCoGe$  doped with Ir, various Sapphire based materials, antiferromagnetic and possible semimetallic material  $UNiSn$  and at last known van der Waals ferromagnet  $VI_3$ . The properties and parameters of various techniques were tested and optimized for achieving the highest possible quality of single crystals.

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