Title: Growth of single crystals in material research

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Abstract:

The subject of this bachelor thesis was a comparative study of single crystal growth methods. The growth of single crystal materials of various classes was tested by multiple methods, especially by growth from supersaturated solution, Bridgman method, Czochralski method and Floating Zone method. Properties and parameters of various techniques were tested and optimized for achieving the highest possible quality of single crystals which parameters were tested by electron microscopy and X-ray diffraction techniques. Suitability and limitations of each method are discussed from the point of size, crystallinity, chemical composition of obtained single crystals and from workload and complexity of the instrumentation.

Keywords: Single crystal, Flux, Bridgman method, Czochralski method, Floating Zone method