Crystal growth techniques and applications

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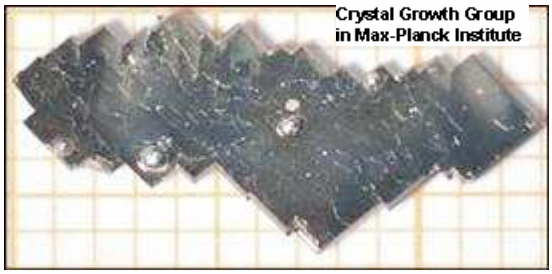
Crystal growth plays an important role in fundamental researches and applications. For example, to study superconductivity, electrical and magnetic anisotropic behaviour and inelastic neutron diffraction experiments of materials, especially new compounds, the growth of large and high-quality single crystals are desperately required. Fabrication of single crystals usually involves various techniques like Czochralski, Bridgman, Floating Zone, Flux growth, and Vapour growth. The choice of growth methods is based on the physical-chemical properties of materials. The presentation will introduce these techniques and two examples of the crystal growth of $YBa_2Cu_4O_8$ and iron pnictides will be shown in detail.

$YBa_2Cu_4O_8$ single crystals



$Ba_{1-x}K_xFe_2As_2$ single crystal

Reference

[1]. G.L. Sun, D.L. Sun, M. Konuma, P. Popovich, A. Boris, J.B. Peng, K.-Y. Choi, P. Lemmens and C.T. Lin, Iron pnictides: Single crystal growth and effect of doping on structural, transport and magnetic properties, arXiv:0901.2728, submitted to PRB

[2]. G.L. Sun, Y.T. Song and C.T. Lin, Investigation of $YBa_2Cu_4O_8$ single crystals grown by KOH flux Supercond. Sci. Technol. 21 125001