

Crystal growth from fluxed melts and novel properties of some Fe^{3+} based weak ferromagnets

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报告摘要: Taking in mind numerous future practical applications of antiferromagnets crystal growth technology of rare earth orthoferrites (REOF) and other optically transparent weak ferro/ferri magnets (WFM), e.g. Fe_3BO_6 , will be of greater importance. It is known that REOF solid solutions of a type $\text{Re}_{1-x}\text{Re}_x\text{FeO}_3$ allow to tailor their properties by varying the type and relative content of rare earth ions. Besides small magnetization moment these materials exhibit a giant Faraday rotation, which we should find out how to explore. Crystal growth studies of REOFs have been provided by many groups through different experimental approaches. Although many efforts have been made, it has not been easy to get perfect single crystals. Nevertheless, large and close to perfect crystals could be grown by the fluxed melt technique using controlled crystallization on seeds from relatively stable solvents based on the appropriate mixture of BaO , BaF_2 and B_2O_3 . Surprisingly not much data published so far on Fe_3BO_6 crystal growth. In our talk I would present results on seeded flux growth of Fe_3BO_6 single crystals. Some new data will be also shown both for $\text{Sm}_{1-x}\text{Re}_x\text{FeO}_3$ ($\text{Re}=\text{Yb}, \text{Gd}$) thermal conductivity evolution, and Fe_3BO_6 Raman scattering features depending on temperature and applied field up to 30T.

报告人简历: Professor of Institute of Solid State and Semiconductor Physics, Belarusian Academy of Science. His current research interests include crystal growth and magnetic behaviors of weak ferromagnets.

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