
Magnetic and Transport Properties of (Ba$_{1-x}$K$_x$)Fe$_2$As$_2$

Single crystals of (Ba$_{1-x}$K$_x$)Fe$_2$As$_2$ were prepared using the Sn flux method. Two heating methods were used to prepare the single crystals: the slow heating and rapid heating methods. It was found that the single crystals grown using the slow heating method were not superconducting due to a significant loss of potassium. When the rapid heating method was used, the single crystals were observed to be superconducting with the desired potassium concentration. The superconducting transition temperatures for the grown single crystals ranged from 8.7 K to 37.1 K. The energy dispersive X-ray spectroscopy (EDS) analysis indicated the presence of multiple phases in the single crystals. Using single crystal X-ray diffraction (XRD), the crystal structure of the single crystals was found to be I4/mmm tetragonal at room temperature. The magnetic measurements on the single crystals indicated the presence of multiple phases and magnetic impurities.