

Single crystal growth of $\text{Zn}_x\text{Cu}_{1-x}\text{V}_2\text{O}_7$ ($x = 0.05, 0.15$) by the vertical gradient freezing technique

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Single crystals of $\text{Zn}_x\text{Cu}_{1-x}\text{V}_2\text{O}_7$ system with doping concentration of 0.05 and 0.15 were grown by the vertical gradient freezing technique. The crystal structures were confirmed by means of x-ray diffraction to be the beta phase of copper pyrovanadate, $\beta\text{-Cu}_2\text{V}_2\text{O}_7$, when the Zn concentration was as low as 0.05, on the contrary to the previous studies on polycrystal samples. The Rietveld refinement on x-ray diffraction patterns showed that that lattice constant along crystallographic a-axis was slightly increased when the doping concentration was decreased from $x = 0.15$ to 0.05. A θ - 2θ scan confirmed that the natural cleaved facet is crystallographic a-axis with FWHM around (200) peak of $0.17(1)^\circ$, suggesting a high quality of the obtained single crystals.

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