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Structural Analysis of the Cu-Mn Alloys using XRD Technique

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Abstract : Co-melting technique is used to prepare $Cu_{0.5}Mn_{0.5}$ alloys. The products were synthesized by the fusion of high pure copper (99.99%) and manganese (99.99%) metals in presence of inert atmosphere. The lattice constant, unit cell volume, structure and inter-planar spacing between two given plane are evaluated by XRD analysis. The average crystallite size is calculated using the Scherrer's equation. Due to intermixing of Cu atoms in the matrix of Mn, a lattice strain is produced in the alloys. Williamson-Hall (W-H) analysis is used to study the individual contributions of crystallite sizes and lattice strain on the peak broadening of the $Cu_{0.5}Mn_{0.5}$ alloys.

Keywords: Co-melting, Crystallite size, W-H analysis, lattice strain & peak broadening.

[Full Paper]