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Electron Diffraction Study on Diffuse Scattering from Disordered Cu₃Au Alloy*

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Abstract

A detailed study has been made on diffuse scattering from Cu₃Au alloy in the disordered state by electron diffraction, using single crystal evaporated films, in order to investigate the origin of the short-range order above $T_e$. Aspects of the diffuse scattering resemble in some respects those of superlattice reflections below $T_e$, which are related to the antiphase domain structure. From the present study, however, it has become clear that there is no direct relation between the short-range order state above $T_e$ and the antiphase domain structure below $T_e$.

Behaviors of the diffuse scattering have been studied, the electron-atom ratio being changed by addition of Pd or In to Cu₃Au. Results obtained are well interpreted by the suggestion of Moss, indicating that the short-range order state revealed by the diffuse scattering originates from anomalies of energy of conduction electrons.