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Diffusion induced atomic islands on the surface of Ni/Cu nanolayers

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Abstract

Surface islands formed by grain-boundary diffusion has been studied in Ni/Cu nanolayers by in-situ low energy ion scattering spectroscopy, X-ray photoelectron spectroscopy, scanning probe microscopy and ex-situ depth profiling based on ion sputtering. In this paper a new experimental approach of measurement of grain-boundary diffusion coefficients is presented. Appearing time of copper atoms diffused through a few nanometer thick nickel layer has been detected by low energy ion scattering spectroscopy with high sensitivity. The grain-boundary diffusion coefficient can be directly calculated from this appearing time without using segregation factors in calculations. The temperature range of

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