

**GRAIN GROWTH AND TEXTURE SHARPENING IN COPPER, NICKEL AND
PALLADIUM THIN FILMS, INVESTIGATED BY NON-AMBIENT
X-RAY DIFFRACTION MEASUREMENTS**

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The microstructure evolution (texture, crystallite size, microstrain and residual stress) of Cu, Ni and Pd thin films (nominal thickness 50 nm) on Si substrates during annealing has been investigated by in-situ X-ray diffraction measurements in a temperature range between 25°C and 250°C.

The thermoelastic behaviour was investigated excluding the occurrence of thermally activated relaxation processes by in-situ stress measurements below ambient temperature. On this basis, above ambient temperature, effects of stress relaxation and emerging secondary stresses (due to grain growth and annihilation of crystal defects, giving rise to a considerable tensile stress contribution) could be identified for all three layers in the temperature regime between ambient temperature and 250°C.

The results are discussed in the light of literature data obtained for thicker films and compared to predictions of different grain-growth models for various thicknesses and temperature regimes.

It is shown that the excess volume in grain boundaries can be determined from the evaluation of the residual stress and crystallite size with temperature.

This abstract is submitted for the Denver X-ray Conference (DXC). A contribution as an oral presentation in the Thin Films session is preferred. We intend to publish this paper in the DXC proceedings.

We hereby give the permission to the organizing committee to include our abstract in the DXC web site and affiliated web sites.

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