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Stress Shift in Metallic Thin Films during Processing

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When an average stress in growing metallic thin film was measured as a function of the film thickness during real time deposition, a reversible stress shift to the tensile side was observed for Al, Cr, and Cu thin films due to an abrupt interruption of deposition. This study comprised the effects of metal mobility and final grain size on the magnitude of the stress shift caused by an abrupt interruption of thin film deposition. The reversible shift was observed only for the interruptions at the compressive stress state. For Al the total amount of stress shift increased as the magnitude of compressive stress at the point of interruption increased. The amount of stress shift increased as the grain size of film before the deposition interruption was larger for Cu.

Keywords: Thin Film, Stress, Mobility, Grain Size