
台灣大學應用力學研究所
演 講 公 告

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講 題： Nanoporous Metal foams and Life at TSMC

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Nanoporous Metal foams and Life at TSMC

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摘要:

Part I. Introduction to nanoporous metal foams

Nanoporous (NP) metal foams, including Au, Cu, Ag, and Pd, have been successfully synthesized using different processes, such as free corrosion, electrochemically driven dealloying, and subsequent heat treatments. To investigate the effect of the synthesis processes on the yield strength and microstructure, the hardness of NP Au, Cu, Ag, and Pd foams with ligament sizes ranging from 20-220 nm was measured using nanoindentation and micro Vickers hardness testing, while the morphology and ligament sizes were determined by scanning electron microscopy (SEM). The results demonstrate that for all these materials, the yield strength of the NP foams was higher than that predicted by macroporous foam scale equations. In addition, combining the results with previous data for NP Au, it was observed that the yield strength of foams increases as ligament size decreases, which emphasizes the significant effect of the ligament size.

Part II. Life at TSMC

Nano structured materials have been widely used in semiconductor industry. For example, thin metal films were synthesized using sputter techniques with thickness ranging from 1- 15 nm. The future industry challenges regarding thin film coating comes from new advance logic circuit design with complex pattern and high aspect ratio. The author will share his working experience, and introduce up to date physical vapor deposition, chemical vapor deposition, atomic layer deposition, and atomic layer etch techniques.