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Self-Assembled Tin Particles Made by Plasma-Induced Dewetting

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Abstract : Tin particles of various size and distribution were self-assembled by plasma treating tin film deposited on silicon oxide substrates. Plasma treatment was conducted using an inductively coupled plasma (ICP) source. A range of ICP power and topographic templated substrates were evaluated to observe changes in particle size and particle distribution. Scanning electron microscopy images of the particles were analyzed using computer software. The evolution of tin film dewetting into particles initiated from the hole nucleation in grain boundaries. Increasing ICP power during plasma treatment produced larger number of particles per area and smaller particle size and particle-size distribution. Topographic templates were also effective in positioning and controlling the size of the particles. By combining the effects of ICP power and topographic templates, particles of similar size and well-ordered distribution were obtained.

Keywords : dewetting, particles, plasma, tin
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