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## **The Effect of Electrolyte Additives on Crystallite Orientation in Galvanic Cu Deposits on $\langle 111 \rangle$ , $\langle 100 \rangle$ and $\langle 110 \rangle$ Cu Surfaces**

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Copper films for applications in printed circuit boards usually have to be fine-grained to achieve even filling of microvias. When galvanically plating Cu films on roll-annealed Cu substrates, unacceptably large epitaxial crystals were found for certain conditions. Here galvanic Cu films were plated on oriented single-crystal Cu substrates from an additive-free electrolyte and from a commercial electrolyte designed for DC plating. The crystallite distribution in the films was mapped with XRD. For the additive-free bath, the transition to a polycrystalline film occurs more readily on  $\langle 111 \rangle$  and  $\langle 100 \rangle$  oriented surfaces, whereas films on  $\langle 110 \rangle$  substrates are persistently epitaxial. A sequence of recursive twinning steps is the main mechanism for the transition to polycrystalline texture. The bath additives promote fine-grained films and they deliver, for the same plating conditions, remarkably improved results.

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