Texture and microstructure evolution in nickel electrodeposited from an additive-free Watts electrolyte - DTU Orbit (09/11/2017)

Texture and microstructure evolution in nickel electrodeposited from an additive-free Watts electrolyte

Nickel layers with 〈100〉, 〈210〉, 〈110〉 and 〈211〉 fiber textures were electrodeposited from additive-free Watts type electrolytes by adjusting both the pH and the applied current density. Quantitative crystallographic texture analysis by XRD was supplemented by micro-texture analysis applying EBSD. While XRD results correspond to absorption-weighted averages over the top part of the layer, EBSD on the cross section allowed studying the texture evolution as a function of distance to the substrate. Although layer growth started on amorphous substrates, implying that nucleation occurs unbiased by the substrate, often relatively strong fiber textures develop already at the early stage of growth. These fiber textures can further develop into other preferred fiber axis further away from the substrate. The experimental results demonstrate that already in an early stage of deposition there are major differences in the developing textures. The evolution of the substrate-adjacent textures into the texture of thick layers depends strongly on the deposition conditions.

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