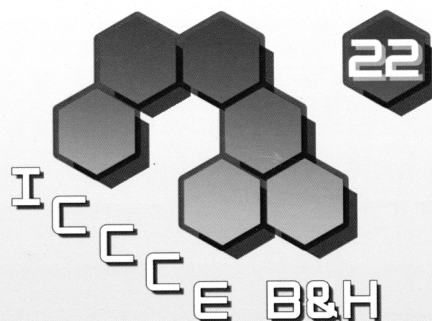


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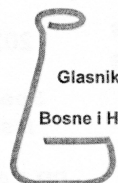
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Morphology, Structure and Hardness of Electrolytically Produced Copper Coatings

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Abstract: Influence of various parameters of electrodeposition, such as type of cathode, composition of the electrolyte and thickness of the coating, on morphology, structure and hardness of copper coatings has been investigated. The Cu coatings thickness from 20 and 40 μm produced by the galvanostatic regime of electrolysis on Si(111) and brass cathodes from electrolytes without and with an addition of leveling/brightening additives were characterized by SEM and AFM techniques. The Vickers microindentation was used for a hardness analysis of the produced coatings, using the Chicot-Lesage (C-L) composite hardness model for estimation of their hardness. The mat microcrystalline fine-grained Cu coatings with the strong (220) preferred orientation were obtained from additive free electrolyte, and the smooth mirror bright nanocrystalline Cu coatings with the strong (200) preferred orientation were obtained from the electrolyte containing additives. Hardness analysis showed that the mat coatings were harder than the mirror bright coatings, that can be explained phenomena on grain boundary.