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RECOVERY OF PRECIOUS METALS FROM WASTE ELECTRONIC EQUIPMENT

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Abstract

Printed circuit boards-PCBs are particularly rich in copper and precious metals. Recoveries of metals in our work started with tests for electrodeposition of Au, Ag and Cu from synthetic solutions on graphite and copper electrodes. Processes were studied using cyclic voltammetry in ranges: (-1200)-500 mV and (-800)-(-200) mV and (-400)-1400 mV. Different supporting electrolytes like: H₂SO₄ 0.5M, HCl 0.1M and HNO₃ 0.1M were used. Electrodeposition of studied metals from real solutions was followed by atomic absorption analyses. The deposit of metals was characterized by scanning electron microscopy-energy dispersive-X-ray analysis. Two techniques were applied for recovery the metals from PCBs: aqua regia dissolution (one step) and dissolution in nitric acid and then in aqua regia (two steps). A new conceptual laboratory installation was constructed. Obtained deposits have been contained more than 95% Au and Ag and 97% Cu.

Key words: deposit characterization, electronic waste, electrodeposition

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