

**Research Title**                    **The Use of Fixer Waste in Metal Plating  
of Plastics and Plant Parts**

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### **Abstract**

In this work, the utilization of photographic fixer waste as silver(I) ion solution, to coat the surface of plant leaves, polypropylene and acrylic plastic in order to conduct electricity was investigated. It was found that it cannot be employed due to its low silver ion concentration. Attempts to increase this concentration by direct evaporation to the desired level was not successful as the solution became gelatinous.

Coated surfaces were examined by means of visual inspection, scanning electron microscope and X-rays fluorescence spectroscopy. The result revealed that electroless plating with silver, obtained from reducing agent, gave better result than that of copper, reduced from copper(II) sulphate solution by using the same reducing agent.

Copper electroplating in an "acid bath" of copper(II) sulfate solution that either obtained commercially or prepared from old electrical wire gave similar results. At a working temperature of 30-35°C and an applied potential of 1.5 V, it was found that suitable current density varied from 650 to 750 A/m<sup>2</sup> with 10 to 40 minutes in coating time. Finished coating with brass in "cold solution" type electrolyte at applied potential of 5 V and current density of 30 A/m<sup>2</sup> showed that the coating time decreased with increasing electrolyte temperature.