

STUDY ON THE ELECTROCHEMICAL REACTION MECHANISM OF TRIVALENT CHROMIUM PLATING IN THE PRESENCE OF CHROME ALUME

Dae-Keun Kang^{a*}

^{a*}Korea Institute of Materials Science(E-mail:dasom7249@hotmail.com)

초 록: Much attention has been recently paid to the trivalent chromium electro-plating for the application of surface finishing, mainly because of the environmental issues. Nevertheless, trivalent chromium plating has several critical issues to be figured out for such applications, including instability of the plating solution, poor property of plates and etc.

1. 서론

The key to successful development of the trivalent chromium plating is how to optimize the composition of the plating solution and its operational parameters. In this work, the electrodeposition behavior of chromium plating solution based on the chrome alum was analyzed. The identification by using the organic brilliance-forming additive was also studied. In this presentation, the characteristics of chrome alum and the contribution of the organic additives to total plating rate will be suggested as a function of plating parameters. These results suggest the useful guideline to find the optimum conditions of the trivalent chromium plating.

2. 본론

The electrolyte was composed of Chrome alum, Ammonia sulfate, Boric acid, Formic acid, and Ammonia solution. Then, the electrolyte has to be examined with a usual Hull cell, MMO anode is used, the electrodeposition is carried out at the current value of 5A, at a temperature of about 20-25°C on the sample of copper foil during strictly 3 minutes. For the electrochemical measurements, the working electrodes were prepared from copper sheet. Cathodes were coated with non-conducting tape to leave an exposed area of 5X5cm². A solartron 1287A electrochemical interface was employed to carry out the potentiodynamic test. The qualities of the metal deposits were assessed visually, optical microscopy, scanning electron microscopy, and XRX Coating Measurement Instrument, in terms of structure, thickness, porosity, pitting, cracking, and micro cracking.

3. 결론

In order to develop the optimum condition of the trivalent chromium plating, experiments about the model system have been progressing by using the chrome alum. Therefore, experiments that are used chrome alum will be suggested as the useful characteristic parameters of trivalent chromium electro-plating.

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