A New Method for the Evaluation of Electrodeposition Behavior for Electroplating Through Mask

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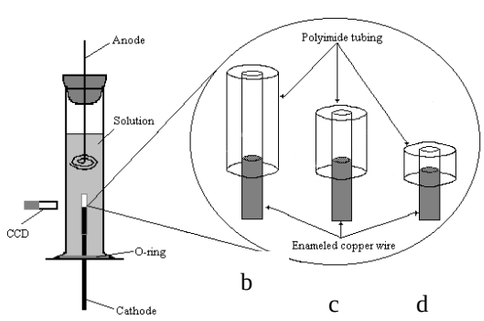
The requirement of the parameters selection on electroplating through mask is stricter than the traditional electroplating therefore results in difficulty occurring on operation parameters selection. This paper presents a new device, which provides both an in-situ observation together with chronopotential methods. As this is a convenient modeling method the correspond- ing aspect ratio of deep hole can be easily adjusted therefore it can help us to evaluate the effect of various operation parameters such as, current density, the concentration of surfactant and ultrasonic power on deposition behaviour.

In addition, this in-situ device studies the roles of the hydrogen bubbles. The electroplating through mask can be proceeded with qualified parameters obtained from this in-situ modeling device.



Figu a ı) showing present designed device for the electroplating system, (b)-(d) schematically showing the magnified part in (a) with different aspect ratio of deep hole.

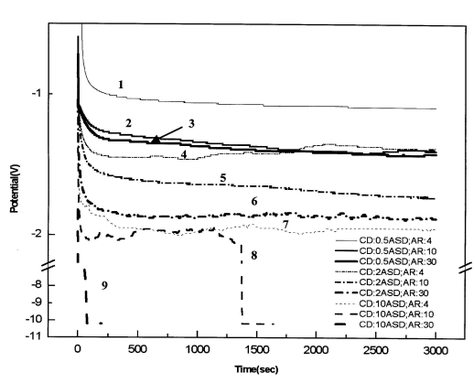


Figure 2 showing that by chronopotentiometry method, with different aspect ratio of the deep hole, the overpotential would be enhanced with its corresponding resistance. (Note: CD : 0.5 ASD means current density 0.5 A/dm^2 ; AR:4 means aspect ratio 4)

Polyimide tube Produced bubbles

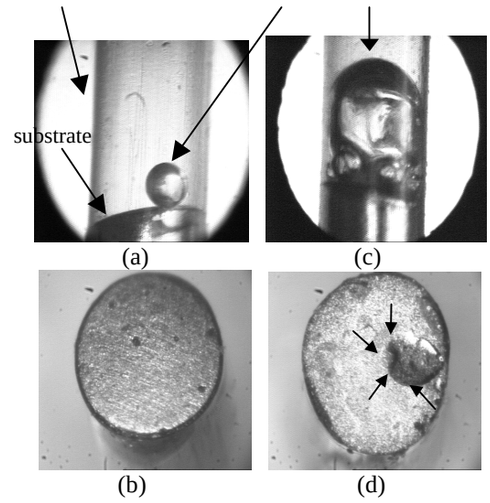


Figure 3. showing that for the aspect ratio 10 condition, (a)a small bubble present together with its final smooth deposition layer (b); with bigger aspect ratio of 30 (c), the bubble were accumulated resulting in (d) the deep hole (as arrowed) remains in the deposition layer which is harmful for the mechanical property of the electroforming body.

Reference

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