

Gold Cathode Current Efficiency Analysis

Materials

1. Constant current rectifier.
2. Stainless Steel or Platinum Clad Columbian Anodes – each
3. Magnetic hot plate/stirrer.
4. Timer or amp-minute meter.

Procedure

1. Cut a Brass Hull Cell panel into a 1" x 4" strip. Bend the top of the strip into a hook shape so it may be hung from a small support rod.
2. Electroclean and activate the strip and plate in 500 ml of Gold solution for approximately 5 minutes at 0.3 amps.
3. Retrieve another 500 ml sample of the Gold solution and set on the hot plate stirrer. Set the agitation to an intermediate level and heat to 100⁰F for hard Gold, or 130⁰F for soft golds.
4. Attach the two anodes to the inside of the beaker so that they face each other. Use a jumper to connect the anodes together.
5. Dry and weigh the test strip on an analytical balance to the nearest 0.1 milligram.
6. Electroclean, activate and rinse the test strip in D.I. water.
7. Hang the piece on a center support rod on the beaker. Only the bottom 3.0" of the strip should be in solution.
8. Plate the coupon at 0.42 amps for ten-minutes for hard Gold. This equals an effective current density of 10 ASF. If, the chemistry is a pure soft Gold, plate at 5 ASF at 0.200 amps for 10 minutes.
9. At the end of the plating cycle, rinse the test part well in D.I. water. Weigh on the balance again to the nearest 0.1 milligram.

Calculation

$$\frac{(\text{Weight in gm. After} - \text{Weight in gm. Before}) \times 100}{\text{amp-minutes plated} \times 0.1225} = \% \text{Cathode Current Efficiency}$$

Note: amps x minutes plated = amp-minutes