Dear Reviewer 2

**JoVE59376**

“Accumulation and Analysis Methods of Copper Ion in Copper Sulfate Plating Solution”

Toshiaki Koga, Yoshitaro Sakata, and Nao Terasaki

We thank reviewer for careful reading our manuscript and for giving useful comments. We appreciate that you are interested in our report. We have revised the manuscript JoVE59376 on the base of the reviewer comments.

We look forward to a publication of our manuscript in Journal of Visualized Experiments.

Sincerely

Toshiaki Koga

Our responses to the reviewew comments are as follows. The correction is described in red in the text.

1. It must be clearly stated why only BCS was chosen, is it economic?

**Reply:**

I added it in the red during the introduction.

The cuproine type color reaction reagent, which has been conventionally used for the determination of Cu(I), is hydrophobic and extraction with alcohol is necessary. It was shown that BCS is hydrophilic and can directly measure Cu(I) in aqueous solution.

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1. The effect of temperature, pH,operating current/voltage and Cu sulfate concentrations on this solutions must be shown, as these are the industrial plating constrains.

**Reply:**

The relationship between plating solution conditions and Cu(I) accumulation is interesting. However, we did experiments under the same conditions, so we do not have knowledge of the effects of temperature and sulfuric acid concentration. The relationship with the current value is a major problem and it is described in reference 14. I added a sentence in the discussion.

Although the accumulation amount of Cu (I) tends to increase with the electrolysis time, it is saturated by excessive current (for example, electrolysis for more than 10 minutes at 1 A). The Cu (I) accumulation amount increased with the current value by electrolysis for 10 minutes when the current value was 0.5 to 1.0 A14.

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3. The section 2.2. is not clear.

**Reply:**

The explanation of 2.2 has moved to RESULTS.

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4. line no. 109, error on section no.

**Reply:**

I fixed the mistake.

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5. line no. 138, do not agree with 'thoroughly melt BCS'

**Reply:**

As you pointed out, 10-2 mol/L BCS can not be completely melted. Correct the sentences and add them.

3.1. The BCS solution (10-2 mol/L) is prepared by dissolving 0.36 g of the molecule in 100 mL of pure water. Stir the solution and dissolve the BCS in an excess amount relative to the monovalent copper. Store the BCS solution in a dark container and store it in the dark.

NOTE: In the measurement, the BCS concentration in the sample solution is adjusted to 1000 times or more the Cu(I) concentration.

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6. line no. 284, please give the value of excessive current.

**Reply:**

It depends on experimental conditions, but we added one example.

Although the accumulation amount of Cu (I) tends to increase with the electrolysis time, it is saturated by excessive current (for example, electrolysis for more than 10 minutes at 1 A). The Cu (I) accumulation amount increased with the current value by electrolysis for 10 minutes when the current value was 0.5 to 1.0 A14.

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7. Why the study is limited to 10 minutes.

**Reply:**

When an excessive current flows, the correlation between electrolysis time and Cu(I) accumulation amount collapses. For 1.0 A electrolysis, 10 minutes is the limit.

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8. It is better to have results and discussion together.

**Reply:**

Revised REPRESENTIVE RESULTS (insert 2.2), and put the FIGURE LEGENDS term.