

THE USE OF A Ag PSEUDOREFERENCE ELECTRODE FOR ELECTROCHEMICAL STUDIES OF COPPER IN 1-BUTHYL-3-METHYL-IMIDAZOLIUM CHLORIDE (BMIMCI).

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In electrochemical studies, a three-electrode cell incorporating a stable reference electrode is essential to avoid uncertainty of the electrode reactions. However, a universal reference electrode has not so far been reported in the literature for electrochemical studies in ionic liquids. Instead, the use of pseudoreference electrodes (e.g. silver, gold or platinum wires immersed directly into the solution) is very common, but their potentials could be unstable and vary with many factors, making their use unappropiated in electrochemical studies.

The stability of the Ag pseudo-reference electrode was checked by studying the electrochemical behavior of Cu(I) and Cu(II) solutions in the 1-buthyl-3-methyl-imidazolium chloride ionic liquid.

For solutions containing Cu(I), a Ag wire can be used as a pseudo-reference electrode. Notwithstanding, for the studies with Cu(II) solutions this material must be avoided in order to prevent the chemical reaction:

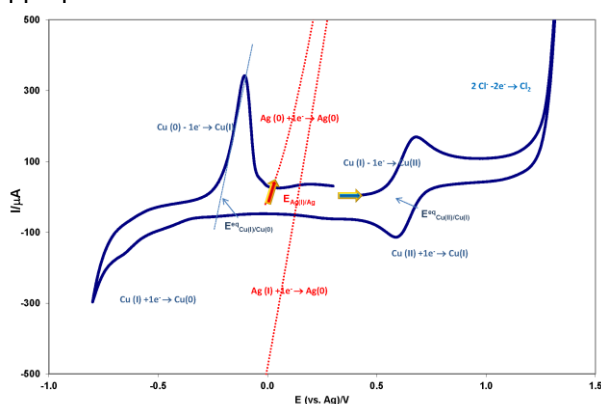
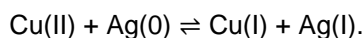


Fig. 1.- Cyclic voltammograms obtained with: (red) purified BMIMCI on a Ag electrode, (blue) a solution of Cu(I) in BMIMCI on a Pt electrode ($C_0 = 2.35 \times 10^{-5} \text{ mol cm}^{-3}$)

Figures 2(a) and (b) show the electrodeposits obtained with either Cu(I) or Cu(II) solutions using a Ag reference electrode. Pure Cu electrodeposits were obtained from a Cu(I) solution, whereas a Cu-Ag intermetallic compound was obtained from a Cu(II) solution.

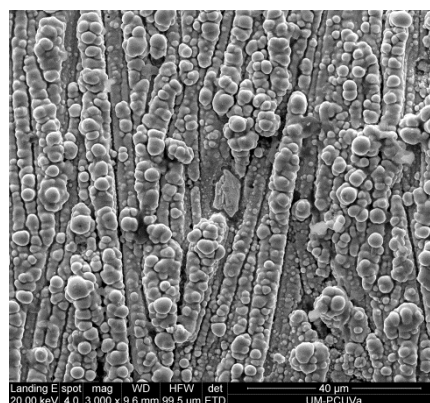
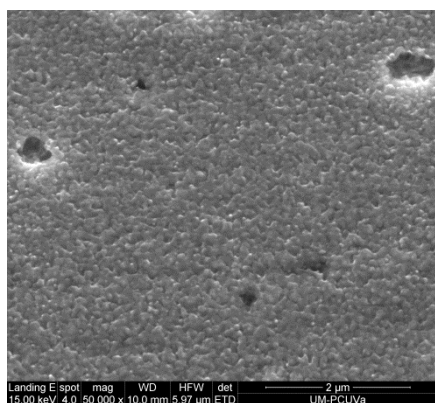


Figure 2.- Electrochemical deposits obtained using the Ag pseudoreference electrode in BMIMCI containing (a) Cu(I) and (b) Cu(II).

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