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EXPERIMENTAL

Materials and methods

Electrochemical measurements were performed on an AUTOLAB-30 potentiostat - galvanostat with a computer control station in its potentiostatic mode, in 0.01 mole/L Tl_2SO_4 solutions. The background electrolyte was of 0.5 mole/L Na_2SO_4. The area of the working electrode was 1 cm^2, platinum was used as an auxiliary electrode, and a silver chloride electrode served as reference. Preparation of electrodes was carried out by mechanical and chemical cleaning.

Mechanical treatment was carried out in order to remove visible contaminants. Chemical cleaning contributed to the dissolution of various compounds from the electrodes' surface. Concentrated solution of nitric acid (HNO_3) was used for this. Nitrate, sulfate, and sodium acetate were used as background electrolytes. Cyclic polarization curves were obtained in the temperature range of 20-60^{0}C and at potential sweep rates of 5-50 mV/s.

In order to establish the limiting stage of the electrochemical process, experiments were carried out at solution stirring rates equal to 0-1000 rev/min. All quantitative measurements were carried out in at least three replicates and processed statistically. Electrochemical calculations were performed by using Microcal Origin 8. Quantitative analysis of the composition of the precipitates was carried out by using an ICP OES 8000 optical emission spectrometer (Perkin Elmer) with the WinLab 5 software.

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