



β -chloropropiophenone reduction in dimethylformamide on Pt

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Abstract: β -Chloropropiophenone reduction in dimethylformamide on platinum electrode has been studied using potassium perchlorate or tetra-*n*-butylammonium tetrafluoroborate as support electrolyte. Voltammetric and surface sensitive Fourier transform IR spectroscopy (FTIR) experiments have been carried out and it has pointed out the presence of an inhibition process in the reduction of the β -chloropropiophenone on a Pt electrode. Although the inhibition process occurs in both cases, the use of KClO₄ or (Buⁿ)₄NBF₄ presents a significant different behavior in the reduction process. The influence of same variables such as β -chloropropiophenone, water or oxygen concentration have been studied and rotatory disk electrode experiments have been made in order to conclude the best reaction conditions. The inhibition process is strongly determined by the electrode potential. The inactivation of the electrode surface is held at initial potential, including under forced convection conditions, however it disappears at high electrode potential, in contact with atmosphere and at open circuit during long or shorter time with the help of convection. The inhibitor does not seem to be soluble in this electrolyte (it takes time to dissolve at open circuit) but it is soluble in the moisture or the atmosphere. On the other hand, it seems to be related with electrode charge. The effect of an ultrasonic field in the reduction process has been investigated. The intensity of the ultrasonic field and the influence of the working electrode transducer gap have been studied but did not avoid the inhibition process.

Key words: ultrasound, electrochemistry, platinum, DMF, β -Chloropropiophenone.