A study on Electrosynthesis of 2,5-dichlorophenol Using Titanium Anode Coated with Metallic Oxide

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doi: 10.20964/2018.01.10

Received: 25 September 2017 / Accepted: 24 October 2017 / Online Published: 1 December 2017

A conventional thermal decomposition method was used to prepare Sn-Ir electrodes modified with Sb-, Co-, and Ce-based oxides, which were applied to synthesize 2,5-dichlorophenol by the electro-oxidation of 1,4-dichlorobenzene. The morphology of the electrodes was investigated by scanning electron microscopy (SEM) and X-ray diffraction (XRD). Cyclic voltammetry (CV) and linear sweep voltammetry (LSV) tests were employed to analyse the electrolysis experiment and electrocatalytic activity of the electrodes. The results showed that Sn-Ir electrodes doped with designated amounts of Sb, Co or Ce could compact the coating, and improve the stability of the electrode. Typically, Sn-Ir doped with 1% Ce had a good response in the LSV measurement, which yielded a 2,5-dichlorophenol concentration of 45% with a selectivity of 85%. The conversion rate of 1,4-dichlorobenzene was 53%, which indicated that the Sn-Ir-Ce electrode had a better catalytic activity.

Keywords: 2,5-dichlorophenol; electrosynthesis; Sn; Ir; Sb; Ce; Co

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