Preparation and Investigation of Nickel–Antimony co-doped Tin Oxide Anodes for Electro-catalytic Oxidation of Organic Pollutions

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Nickel(Ni) and antimony(Sb) co-doped Ti/Ni-Sb-SnO₂ electrodes were prepared by pyrolysis coating method and then investigated by scanning electron microscopy (SEM), X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), linear sweep voltammetry(LSV), electrochemical impedance spectroscopy (EIS) and accelerated service life test. We discussed the changes of oxygen evolution potential and charge transfer resistant on the Ti/Ni-Sb-SnO₂ electrodes in a physical perspective. The oxygen evolution potentials improved obviously. Furthermore, the failure mechanisms of the electrodes have been studied using the EIS and SEM techniques. Our study showed that the deactivation of Ti/Ni-Sb-SnO₂ electrode was mainly due to the formation of a passive TiO₂ passive interlayer between the Ti substrate and the coating.

Keywords: Titanium-based Tin oxide electrodes, DSA electrodes, Nickel, Antimony

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