

## Microwave-Assisted Synthesis of RuO<sub>2</sub>-TiO<sub>2</sub> Electrodes with Improved Chlorine and Oxygen Evolutions

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**Abstract :** RuO<sub>2</sub>-TiO<sub>2</sub> electrode now becomes popular in the chlor-alkali industry because of high electrocatalytic and stability with chlorine and oxygen evolutions. Using alternative green method for preparation RuO<sub>2</sub>-TiO<sub>2</sub> electrode is necessary to reduce the cost, time. In addition, it is needed to increase the electrocatalyst performance, stability, and environmental compatibility. In this study, the Ti/RuO<sub>2</sub>-TiO<sub>2</sub> electrodes were synthesized using sol-gel method under microwave irradiation and investigated for the anodic chlorine and oxygen evolutions. This method produced small size and uniform distribution of RuO<sub>2</sub>-TiO<sub>2</sub> nanoparticles with mean diameter of 8-10 nm on the big crack size surface which contributes for the increasing of the outer active surface area. The chlorine, oxygen evolution efficiency and stability comparisons show considerably higher for microwave-assisted coated electrodes than for those obtained by the conventional heating method. The microwave-assisted sol-gel route has been identified as a novel and powerful method for quick synthesis of RuO<sub>2</sub>-TiO<sub>2</sub> electrodes with excellent chlorine and oxygen evolution performances.

**Keywords :** RuO<sub>2</sub>, electro-catalyst, sol-gel, microwave, chlorine, oxygen evolution

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