



## A novel 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 of RuO<sub>2</sub>-TiO<sub>2</sub> electrode is necessary to reduce the cost, time, 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 can produce 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 outer active surface area. The chlorine, oxygen evolution efficiency, and stability comparisons show considerably higher for microwave-assisted electrodes than for those obtained by the conventional heating method. 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>; Electrocatalyst; Sol-gel; Microwave; Chlorine; Oxygen evolution

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