# Study on electrochemical properties of titanium-oxide $Ru_{0.3}La_xTi_{(0.7-x)}$ electrode*

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**Abstract** The Ru0.3LaxTi(0.7-x) electrodes are made by sol-gel method. The effect on chlorine evolution performance, strengthening life and surface morphology of electrodes doped with $La_2O_3$ are studied. Results: The titanium etched by acid and then alkali has a large specific surface area, while the titanium etched by acid had no obvious nanopore; The incorporation of $La_2O_3$ could reduce the film resistance and electrochemical transfer resistance of the electrode, enhance the conductivity of the coating; The electrode doped with 1% $La_2O_3$ coating has a smaller electrochemical transfer resistance than Commercial DSA under the same unit molar mass of Ru, which will reduce the cost of Ru; The electrode doped with 1% $La_2O_3$ has the highest reaction rate constant among the electrode doped with 0%$La_2O_3$, 2%$La_2O_3$ and 3% $La_2O_3$; The electrode doped with 1% $La_2O_3$ has higher life than the electrode doped with 2% $La_2O_3$ and 3% $La_2O_3$.

**Keywords:** AC impedance; Metal oxide electrode; Chlorine anode; Mechanism; Accelerated life