

### Destruction of aniline by mediated electrochemical oxidation with Ce(IV)

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Mediated Electrochemical Oxidation (MEO) was employed for the destruction of organic containing wastewater. Aniline was used as the representative organic material and cerium (Ce) was used as the oxidant. Ce(III) solution was first oxidized to Ce(IV) and then aniline was oxidized by Ce(IV) with carbon dioxide produced as a final oxidation product. A small-scale MEO reactor, with a electrochemical cell was used and operated at an applied current density of  $0.55 - 0.65 \text{ A / cm}^2$  ( $70^\circ\text{C}$ ,  $0.9 - 0.95 \text{ M Ce(III)}$ ).

The effect of solution temperature and the initial aniline concentration were studied on the performance of MEO system. Amount of aniline destruction was studied based on the  $\text{CO}_2$  production. The performance of the electrochemical cell based on the current and energy efficiencies were also analyzed. The speed of hydrolysis of water at various concentration of Ce (IV) and various voltage on an electrochemical reactor, were studied. Oxygen evolution taking place during oxidation Ce(III) at the anode is suppressed only by large amount of Ce(III), leading to high current and energy efficiencies.