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Editorial

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Service Life of Electrodes Applied in Electrochemical Oxidation Processes

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Editorial

In recent years, novel advanced oxidation processes based on electrochemical technology known as electrochemical advanced oxidation processes have been applied to the degradation of a wide range of persistent organic pollutant. EAOPs produce in-situ hydroxyl radicals capable of degrading POPs and their mineralization by producing stable electrode materials. Moreover, ozone and sulfate radicals could be produced, based on electrolyte type, which cause the degradation of POPs. Although EAOPs are promising novel technologies, various parameters related to the types of electrodes in the POPs oxidation have not been fully addressed. In order to provide a full and comprehensive picture of the current state of the art, and improve the treatment efficiency and motivate new researches in these areas, this study analyzed the research covering EAOPs aspects, with a focus on the comparison of stability, lifetime and service life of electrodes. Electro-chemical stability and longer life are the major concerns in the EAOPs. Since electrodes must be highly efficient for long periods of time, the determination of their lifetime is essential. On the other hand, in real-life situations, lifetime determination is difficult. The oxidation ability and durability of electrodes during the reactions depended on the structural properties of them. Electrodes composed of intermediate compounds had a higher lifetime than binary oxides. Another factor affecting the stability of the electrodes was the structure of the expanded mesh style anodes to better control the bubble growth through a polygon zed structure. Anodes with irregular shapes at the surface were more likely to discharge the bubbles and reduce the negative effects of the high pressure on the surface of the electrode. The electrodes having high oxidation strength and stability had a shorter service life value. Furthermore, the calcination temperature and the amount of applied current directly affected the lifetime of the electrodes. On the other hand, the electrical resistance of the synthesized electrode was effective in the lifetime. Coating of electrodes with noble metals such as tantalum, titanium, niobium, zirconium, hafnium, vanadium, moly date and tungsten improved the electrode stability.

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