

Cost Modeling for Wastewater Treatment by Using a Packed-bed Electrode Reactor (PBER)

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A cost model is presented to predict the power consumption and the demanded electrode area of a packed-bed electrode reactor (PBER) during wastewater treatment. The experimental results from oxidation of organic pollutants in ribonucleic acid (RNA) manufacturing wastewater on an IrO₂-Ta₂O₅/Ti anode show high agreement with model prediction, directly verifying rationality of the proposed model. Hence, the presented kinetics can provide a new approach for accurate estimation of electro-oxidation and a useful tool for cell design during electrochemical wastewater treatment by using the PBER.

Keywords: wastewater treatment; cost modeling; packed-bed electrode reactor (PBER); power consumption; demanded electrode area

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