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Direct Borohydride Fuel Cell with Bipolar Membrane for Waste Water Treatment

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ECS Transactions, Volume 59, Number 1

Citation Paata Nikoleishvili *et al* 2014 *ECS Trans.* **59** 479

DOI 10.1149/05901.0479ecst

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Abstract

New original a direct borohydrid fuel cell divided by bipolar membrane with H_2O_2 co-generation was development. It was established that application of bipolar membrane enables to keep constant pH in catholyte within 2.5-3.2 limits, which allowed us to carry out treatment of water polluted by organic compounds in fuel cell catholyte by electro-Fenton and photo-electro-Fenton methods. The electromotive force of borohydrid fuel cell is 1.1 V. Most efficient methods was photo-electro-Fenton, which enabled to decrease COD (start COD = 500 ppm) of catholytes containing phenol, valsaren, BI-58 and valsaciper to 30, 11, 9 and 3 ppm, correspondingly after 180 min treatment. At the increase of catholyte temperature from 20^0C to 40^0C in the same period phenol COD fell to 5 ppm.

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