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BORON-DOPED DIAMOND ELECTRODE-BASED ADVANCED TREATMENT METHODS FOR DRINKING WATER

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Abstract

In this study, boron-doped diamond (BDD) electrode was tested in electrochemical oxidation and reduction processes using the same vertical electrodes undivided cell in order to remove natural organic matter (NOM) and nitrogen compounds (NC) from drinking water. Boron-doped diamond-based electrochemical oxidation process has proven to be an efficient and versatile method suitable for NOM and NC in forms of nitrite and ammonium present in drinking water sources. However, the application of BDD-based electrooxidation process is limited due to the nitrate formation as oxidation product for drinking water source characterized by high content of nitrate. It has been found that BDD-based electroreduction process was not an efficient method for nitrate removal, even if it allowed nitrite reduction but with high energy consumption.

Key words: drinking water treatment, electrochemical oxidation, natural organic matter, nitrogen compounds

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