Facile electrocatalytic oxidation of diuron on polymerized nickel hydroxo tetraamino-phthalocyanine modified glassy carbon electrodes

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Abstract

The facile electro-oxidation of diuron occurred at a glassy carbon electrode (GCE) modified with polymerized nickel tetraamino-phthalocyanine (NiTAPc), containing O–Ni–O bridges represented as poly-Ni(OH)TAPc-GCE. The oxidation of diuron occurred at a potential which is 60 mV less than that of poly-NiTAPc (without O–Ni–O bridges) and was accompanied by enhanced catalytic currents. The catalytic rate constant and the diffusion constant were found to be 5.91 × 102 mol−1 L s−1 and 6.43 × 10−6 cm2 s−1, respectively. The linear concentration range of diuron was 3.0 × 10−5 to 3.5 × 10−4 mol L−1 with a limit of detection (LOD) of 3.3 × 10−7 mol L−1 (3δ notation) and a sensitivity of 12.9 A mol−1 L cm−2.