ELECTRO-OXIDATION OF HERBICIDE ACLONIFEN ON GLASSY CARBON ELECTRODE AND APPLICATION TO NATURAL SAMPLES

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Aclonifen is a member of nitro phenyl ether herbicide group. This herbicide is a selective herbicide used for pre- and post-emergence residual weed control of a wide spectrum of annual broadleaf weeds and grasses in soybeans, peanuts, and other large seeded legumes [1]. A new method for the quantification of aclonifen at a low concentration level in supporting electrolyte and natural samples was proposed. The herbicide was examined with different voltammetric techniques such as cyclic voltammetry and square wave stripping voltammetry on glassy carbon electrode. This procedure was based on sensitive peaks formed due to the oxidation of aclonifen on glassy carbon electrode at about +1300 mV over the pH range of 1.0–10.0. The oxidation peak showed quantitative increments with the additions of standard aclonifen solution under the optimized conditions. The anodic peak current was linearity proportional to the aclonifen concentration in the range of 0.2–3.7 µg mL⁻¹ with a correlation coefficient of 0.997 (Figure 1). The interference of some inorganic species and the other pesticides has also been studied. The applicability of the method was tried using the spiked soil and natural water samples. The mechanistic study for the oxidation process on glassy carbon electrode was performed for the elucidation of oxidation peak.

Reference