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Removal of alachlor, diuron and isoproturon in water in a falling film dielectric barrier discharge (DBD) reactor combined with adsorption on activated carbon textile: Reaction mechanisms and oxidation by-products

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Highlights

- Oxidation pathways are investigated in a novel water treatment plasma reactor.
- By-products of pesticides are identified from their fragmentation in HPLC-TOF-MS.
- Nitrification is one of the five main oxidation steps under air plasma.
- Nitrification is dominant for diuron and isoproturon but subordinate for alachlor.
- Oxidation of the aromatic ring as well as of the side chains is observed.

Abstract

A falling film dielectric barrier discharge (DBD) plasma reactor combined with adsorption on activated carbon textile material was optimized to minimize the formation of hazardous oxidation by-products from the treatment of persistent pesticides