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## Hydrolysis of *N*-Phenylimide Herbicide Flumioxazin and Its Anilic Acid Derivative in Aqueous Solutions

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Hydrolysis of the *N*-phenylimide herbicide flumioxazin was studied at pH 2.5-9.0 and 25±1°C by directly analyzing a buffered aqueous solution with column-switching high performance liquid chromatography. Flumioxazin was hydrolyzed *via* a base-catalyzed opening of the cyclic imide moiety with half-lives of 4.1 days, 16.1 hr and 17.5 min at pH 5.0, 7.0 and 9.0, respectively. The primary hydrolysis product was the anilic acid derivative which was subsequently degraded to the corresponding aniline and dicarboxylic acid *via* cleavage of the amide linkage under acidic and neutral conditions, along with a partial recyclization to flumioxazin. Kinetic analysis of the pH dependency of each reaction path showed that the acid-catalyzed cleavage of the amide bond in the anilic acid was an intramolecular reaction where the undissociated form of the carboxyl group participated.

### Keywords:

hydrolysis of flumioxazin, reaction mechanism of hydrolysis, kinetic analysis, column-switching HPLC

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