Abstract

Compounds from the sulfonylurea group are commonly used in agriculture. To register a new plant protection product, scientific research must support the information about the active substance. Based on the literature analysis, knowledge gaps regarding selected active substances were identified. To supplement this knowledge, it is helpful and sometimes necessary to have an extensive library of compounds.

With this in study, this work aimed to create methods for obtaining twenty-nine metabolites and degradation products for five selected active substances: iodosulfuron-methyl, metsulfuron-methyl, mesosulfuron-methyl, tribenuron-methyl, and triflusulfuron-methyl. Twenty-eight metabolites were successfully obtained by utilizing synthesis and degradation methods under acid-base conditions. The final compounds obtained ranged from 5 to 25 grams and were characterized by 1H, 13C NMR, mp, and elemental analysis. All metabolites obtained had a purity of over 95% as determined by LC/MS analysis. The obtained compounds were then used as analytical standards.

The photodegradation route of iodsulfuron- methyl and metsulfuron-methyl was also investigated. Mercury lamps were utilized as a radiation source, a low-pressure lamp with a wavelength of 254nm, and a medium-pressure lamp with a wavelength of 365-366nm. Using the metabolites of iodosulfuron-methyl and metsulfuron-methyl, an analytical method was developed that can be used to monitor the fate and behavior of active substances in water samples.

Marcin Rakowiecki