

以改質氧化鑷搭配節三銅衍生試劑比色法量測嘉磷塞農藥
Colorimetric Determination of Glyphosate by Modified Lanthanum
Oxide and Ninhydrin Reagent

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Abstract

Glyphosate is a commonly and widely applied organic phosphorus herbicide in the agricultural field. It was launched by Monsanto company in the 1970s. Its phloem-mobile properties and slow action in killing weeds allow the herbicide to move throughout the plant to kill all meristems, making it effective for perennial weed control. Its excellent performance also can effectively kill a variety of plants, including herbaceous, broad-leaved, and woody plants. This makes glyphosate second only to DDT (dichloro-diphenyl-trichloroethane) in total amount of pesticide use in the world. Some studies have shown that crops such as wheat, oats, corn, and soybeans have higher glyphosate content, and glyphosate can also be found in beer, wine, and tea. This may lead to long-term bioaccumulation and harm to human or living organisms. Some study considered glyphosate has toxicologically harmful and presents potential association with human carcinogenesis and other chronic diseases. Currently, the IARC (International Agency for Research on Cancer) has classified glyphosate as a possible carcinogen in Group 2A. Therefore, the development of a selective and specific analytical method for glyphosate is significant in the environmental and food safety assessments. This method combines a separation method and analytical technique using classic ninhydrin reaction for determining glyphosate. In this method, glyphosate was adsorbed onto citric acid precursor method modified lanthanum oxide (La_2O_3) from water samples and hydrolyzed by NaClO into glycine, which could be derivatized with ninhydrin and measured using spectrophotometer at 570 nm. This study provides an innovative strategy for detecting glyphosate.

關鍵字：嘉磷塞、節三銅、水解、氧化鑷、檸檬酸前驅物法

Keywords : Glyphosate, Ninhydrin, Hydrolysis, Lanthanum oxide, Citric acid precursor method