



Determination of glyphosate based on its quenching effect on CdTe-quantum dots fluorescence

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Glyphosate is the most widely used herbicide at the moment. It presents a broad spectrum of action, hence its use for many different crops. Regulatory agencies have constantly mentioned the low hazard potential to mammals. However, the International Agency for Research on Cancer concluded in 2015 that glyphosate is "probably carcinogenic to humans." In this work, we propose a multicommutated flow analysis method for the determination of glyphosate, based on the quenching effect produced by this herbicide on the fluorescence of CdTe quantum dots ($\lambda_{\text{exc}}/\lambda_{\text{em}}$: 400/548 nm/nm). The proposed analytical method presents detection and quantitation limits of 0.5 and 1.7 $\mu\text{g mL}^{-1}$, respectively. A sample throughput of 30 samples per hour was obtained by the proposed flow system. Interference studies were carried out to assessing the selectivity of the method, observing no interference from other common pesticides. We carried out recovery experiments in water and cereal samples (amaranth, barley, oat, and quinoa), obtaining recovery yields between 92 and 108% in all the analyzed samples.

The high sample throughput of the proposed method makes it suitable for screening purposes in order to dismiss non-contaminated samples, although positive results would have to be confirmed by mass spectrometry. Hence, we consider that the simplicity, selectivity, and rapidity of this method make it an interesting alternative to other existing methodologies for the analysis of glyphosate in agri-food samples.

