Selective magnetic nanographene oxide solid-phase extraction with high-performance liquid chromatography and fluorescence detection for the determination of zearalenone in corn samples

*Pornpimol Thongprapai[1,2], Wilairat Cheewasedtham[2], Kwok Feng Chong[3], Thitima Rujiralai[1,2]**

[1]Department of Chemistry and Center of Excellence for Innovation in Chemistry, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla, 90112 Thailand

[2]Analytical Chemistry and Environment Research Unit, Division of Chemistry, Department of Science, Faculty of Science & Technology, Prince of Songkla University, Pattani, 94000, Thailand

[3]Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, Gambang, 26300, Kuantan, Malaysia

ABSTRACT

A magnetic nanographene oxide sorbent as a selective sorbent for the magnetic solid-phase extraction combined with high-performance liquid chromatography and fluorescence detection was developed and proved to be a robust method for zearalenone determination in corn samples. Optimum extraction of zearalenone (20 mg magnetic nanographene oxide sorbent, extraction for 15 min, desorption time of 15 min using 1 mL of 0.5% formic acid in methanol) resulted in low limits of detection (05 mg/L) and quantitation (0.13 mg/L) and good linearity range of 0.13–1.25 mg/L with the correlation coefficient of 0.9957. Acceptable recoveries (79.3–80.6%) with relative standard deviations below 4% and satisfactory intra- and interday precisions (2–7.4%) were achieved. Additionally, the proposed method has been proved to be good in several aspects: easily prepared sorbent with high affinity to zearalenone, convenient and fast procedure, and high extraction efficiency.

Keywords: corn, zearalenone, graphene oxide, high performance liquid chromatography, magnetic solid phase extraction