



SPE (EluChrom™) Aflatoxins Extraction from Peanut Skins

David A. Isom, Analytical Sales and Services, Inc.

This application shows the use of a dual-bed SPE product called EluChrom™. EluChrom is a dual-compartment SPE cartridge with two independent beds each with a given task in mind (Figure 1). The top compartment is a floating bed that is not sandwiched between frits. The function of the top compartment is to aid the filtration process by interacting with the sample. However, its role as a chromatographic medium is also significant.

The bottom compartment, or chromatography compartment, contains a polymeric sorbent sandwiched between two frits. The function of the bottom compartment is to chromatographically separate sample components extracted in the top compartment.

Some of the best known of all mycotoxins that threaten our feed and food supply are the aflatoxins, products of *Aspergillus flavus* and *A. niger* growth in corn, peanuts, copra, cottonseed, and other popular feed stuffs.

Aflatoxins B1, B2, and G1, G2 are the most common types of poison *Aspergillus* products encountered in the feed industry. The ingestion of aflatoxins suppresses growth, productivity, and immune function. These compounds cause severe liver damage and both intestinal and liver cancer in a wide variety of models.

Aflatoxin contamination can result from the growth of *Aspergillus* in grains and pulses in the field, in farm storage and after processing. Infections are not uniform throughout a load of feed, which makes effective sampling of feed very difficult.

A simple yet effective method for the isolation of Aflatoxins from corn, peanuts, copra, cottonseed, and other popular feedstuffs, is described below.

The extraction process utilizes a method called modified matrix solid phase dispersion (MMSPD). We use the product EluChrom to facilitate this procedure.

Experimental Conditions

Isolation procedure: A 3-mL EluChrom cartridge was flushed with 2 mL of MeOH, followed by 2 mL of distilled HOH. Sample was pulverized and a 100-mg sample was added along with 1 mL HOH to the cartridge. Both top and bottom caps were secured and the cartridge shaken for 5 min. The HOH layer is eluted off and dis-



Figure 1: EluChrom with fixed bed and floating bed.

carded. An additional 3 mL HOH is added and discarded. Next, 1 mL of acetone is added and eluted off into a 2-mL vial, which will be chromatographed.

Chromatographic conditions: HP1090 HPLC, 50:50 HOH:MeOH, min/min. Detection: 365 nm via fluorescence. HPLC Column Advantage 100 C18 25 cm × 4.6 mm i.d. (ADV5008). Examples shown top to bottom: Aflatoxin standard. Aflatoxin standard spike onto EluChrom cartridge and HOH extract. Aflatoxin standard spike results detected within acetone extract. Peanut skin assay (100-mg sample) from acetone extract.

Conclusion

This patent pending device is packed with a unique polymeric sorbent which is ideally suited for biopharmaceuticals, environmental, and water purification applications. This innovative extraction device is feasible for all classes of tissue sample extractions including both plants and animals, or any other sample that may cause standard SPE to bind or clog.

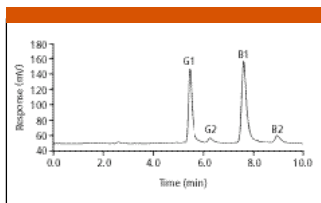


Figure 2: Aflatoxin standard.

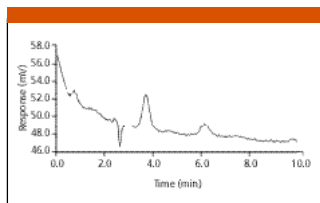


Figure 3: Aflatoxin spike — water phase.

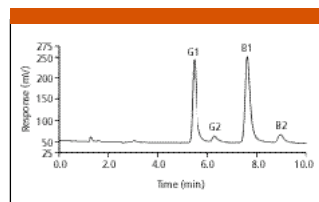


Figure 4: Aflatoxin spike — acetone phase.

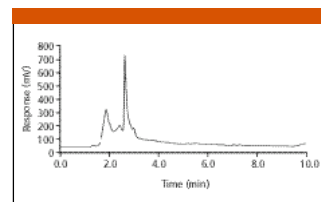


Figure 5: Peanut skin extract — acetone phase.

Analytical Sales and Services, Inc.

230 West Parkway, Unit One, Pompton Plains, NJ 07444
tel. (800) 899-4752 or (973) 616-0700, fax (973) 616-0133
<http://www.analytical-sales.com>