

**Extraction of Residual Chlorinated Pesticides from Cotton Matrix**

As a part from certification method of cotton reference material

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ABSTRACT

As a part of developing a certified testing method for residual pesticides analysis in cotton materials using gas chromatography (GC), the target pesticides listed in Oeko-tex standards should be isolated from a homogenized cotton matrix. The sample homogeneity and extraction procedures are the most effective steps in this analysis. Any error in this procedure must leads to incorrect results. Two extraction methods were used throughout this work with different solvents e.g. methanol, hexane, hexane/acetone (1:1 v/v) and dichloromethane. Extraction methods were Soxhlet (SOX) and accelerated solvent extraction (ASE). The resulted extracts were concentrated then injected in a GC equipped with Electron Capture Detector (ECD). The qualitative results when compared with those of the NIST standard reference materials (SRM-2261) that certified by the National Institute of Standards and Technology USA, proved that the ASE and SOX techniques with dichloromethane as extracting solvent is more selective for all concerned pesticides for homogenized cotton samples. The ASE extraction with dichloromethane is better for hexachlorobenzene, gamma-HCH, heptachlor, Cis-chlordane, trans-nonchlor and SOX extraction technique with dichloromethane is better for Heptachlor epoxide, 4,4'-DDE, Dieldrin, 2,4'-DDD, 4,4'DDT and Mirex.

Keywords: Cotton, Oeko-Tex, gas chromatography; organochlorine pesticides, cryogenic homogenization, liquid extraction

Introduction

Pesticides are biologically active compounds, which control the growth of organisms e.g. bacteria, fungi, algae, insects or plants. The main objective of using pesticides is to improve a crop yield and quality by controlling the growth of the organisms. It has been observed that 18 percent of the world's production of pesticides is used in cotton plantations [1-3] Excessive use of pesticides causes severe environmental degradation and research efforts are being made all over the world to

find alternatives for these harmful chemicals [4,5].

Oeko-tex standard 200 includes list containing 2,4,5-T, 2,4-D, aldrin carbaryl, DDD, DDE, DDT, dieldrin, α and β -endosulfan, endrine, heptachlor, heptachloroepoxide, hexachlorobenzene, α and β and δ -hexachlorocyclohexan, lindane, methoxychlor, mirex, toxaphene and trifluralin. These pesticides might be used for natural fibers and these are critical because of their toxicity and persistence. This Oeko-tex standard establishes testing and cleaning-up procedures by gas