

### **B74 The Identification of the Polymer-Bonded Drugs on the Fabric Surface: A Challenge to the Forensic Drug Analysts**

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**Learning Overview:** After attending this presentation, attendees will have useful learning experience about a unique method of drug concealment adopted by drug smugglers and about the identification of polymer-bonded heroin.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by illustrating a new extraction.

Drug trafficking through concealment, by adopting various tactics, has always been a method of choice for drug traffickers worldwide. Due to an increase in global demands for illicit drugs, drug dealers and smugglers are designing and adopting new methods to camouflage these drugs to bypass tight security checks at regional and international borders. The detection and identification of drugs from the skillful tactics of smugglers has always been a challenge for law enforcement agencies, international border security forces, and crime laboratories. This case study reveals a new trend in the smuggling of illicit drugs through their concealment as a fabric coating with finishing polymers before exportation. This study also describes the challenges in detection and identification of polymer-bonded drugs.

Fabric bearing a suspected coating of a finishing chemical was seized from an international traveler by the Federal Investigation Agency of Pakistan. It was submitted for examination of the surface coating for the presence of any explosive or narcotic drugs. The surface morphology of the fabric was examined stereo microscopically and led toward the suspicion that it had some unusual coating on its surface. It was further examined by using Scanning Electron Microscope/Energy Dispersive X-ray Spectroscopy (SEM/EDX), which indicated the presence of an unusual coating different than normal finishing coating on the surface of fabric. The coating material was scraped off by using a spatula and extracted in acetone (30min sonication) for explosives analysis. The extract was screened for explosive material by using color tests. No traces of high- or low-explosive materials like Trinitrotoluene (TNT), Research Development Explosive (RDX), Pentaerythritol Tetranitrate (PETN), black powder, flash powder, or Improvised Explosive Mixture (IEM) were found. It was further analyzed by using Gas Chromatography/Mass Spectrometry (GC/MS) and Fourier Transform Infrared (FTIR), but no explosive material was detected. Instead, GC/MS results revealed the presence of heroin (diacetylmorphine). FTIR spectrum indicated the presence of a polymeric material and did not indicate the presence of heroin; possibly the heroin signals were suppressed due to the excessive amount of polymer.

Keeping in view all these results, the scraping of fabric coating was tested for narcotic drugs by using standard test methods that involve the use of methanol for extraction purposes. Methanol extract of the scraping was screened for the presence of illicit narcotic drugs, but no drug was detected. The standard method was modified by replacing the solvent methanol with acetone and including an additional step of sonication for 30min. Acetone extract presented a positive color test for heroin, and a strong signal of heroin appeared on the chromatogram by using GC/MS. This extraction method acted well to unbind the coated material from the fabric and disentangle the suspicious chemical in the coating material employed on the fabric through physical adhesion.

Awareness of the drug analysis community about this new way of concealing illicit drugs will be quite helpful in analysts' routine work.

#### **Smuggling, Polymer-Coated Drug, Heroin**