A111 An Evaluation on Characteristics of Textile Polymers

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After attending this presentation, attendees will have been provided information on the physical characteristic of fiber using microscopic and spectroscopic techniques and chemical characteristic.

This presentation will impact the forensic community by its design to find out how fiber identification is accomplished internally and externally in the particular fiber group.

In criminal investigations, fiber transfer occurs between the suspect, victim and the materials at the crime scene. Synthetic or man-made fibers generally come from synthetic materials such as petrochemicals. But some types of synthetic fibers are manufactured from natural cellulose; including rayon, modal, and the more recently developed Lyocell. Cellulose-based fibers are of two types, regenerated or pure cellulose such as from the cupro-ammonium process and modified or derivitized cellulose such as the cellulose acetates. Fibers are useful traces in the reconstruction of criminal events. The most useful main characteristics are the color, type, diameter, and thickness of the samples, additive material, infrared absorption index as minimally destructive methods and reflected index, solubility, chemical composition as destructive methods. The aim of the presented study is to provide information on the physical characteristic of fiber using microscopic and spectroscopic techniques and chemical characteristic. In case, 30 difference types of cloth sample was collected in characteristics groups. Knit structure of the cloth sample was identified for fiber thickness, degree of fiber damage (spoiled), state of colorants processing as morphologic characteristic, infrared absorption spectra as spectrophotometary of 30 cloth samples, and divided into 10 groups. Also identified were major trace elementary components using ICP. This research is designed to find out how fiber identification is accomplished internally and externally in the particular fiber group through the study on optical microscope fine structure high polymer, micro polymer fiber characteristic by optical microscope, micro polymer fiber characteristic by SEM, micro polymer fiber characteristic by FT-IR, evaluation of fiber element analysis by CCM, analysis of fine element by ICP. This study can supply a minimally destructive(non-destructive) and destructive methology for classification and identification of similarity between samples.

SEM, Fiber, FT-IR

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