J25 Empirical Differentiation and Profiling of Processed Colored Inkjet Inks Using Fourier Transform-Infrared Spectroscopy

Rashmi Sharma, Central Forensic Science Laboratory, CFI's Complex, Hyderabad, INDIA; Rajeev Kumar, MSc, 5/300 New Ram Nagar, Agra, INDIA; Kavita Goyal, MSc, Forensic Science Laboratory, Sector-14, Rohini, INDIA; and A.K. Gupta, DSc, School of Forensic Science, SHIATS, (formerly Allahabad Agriculture Institute), Allahabad, INDIA*

After attending this presentation, attendees will understand the factors which differentiate the processed inkjet inks and the features which are similar in inkjet inks of different printers of same brands and different brands. This presentation will show the significant use of Fourier transform-infrared spectroscopy in the examination of the cases related to inkjet printer.

This presentation will impact the forensic science community by providing information which could be used to create a database and could be applied to actual case work due to very good sensitivity and reproducibility of the technique.

Processed ink from 208 samples was taken from printouts printed by different types of printers manufactured by someof the leading companies. The samples were taken in the form of printouts from printers of different manufacturers and models. The same substrate has been taken for the collection of samples. All the four primary inks are considered. The sample collection includes the printout from printers containing both cartridges (i.e., refilled and original cartridges). The random sample collection has been done from different local markets of India. Samples were prepared by keeping cyan, magenta, yellow, and black content constant for each sample using a commercial word pallet software. The samples were collected in the form of colored rectangular blocks. A known quantity of section was removed from the surface of the document and ink was extracted from the substrate by using standard extraction procedures. The samples were dissolved in a constant amount of suitable solvent and kept for some constant time. A series of solvents which are suitable to dissolve the inkjet inks was also given. The samples were then scanned by preparing KBr palettes. The IR spectra were recorded using FT-IR spectrophotometer. The significant peaks were selected and identified to indicate the chemical difference in inkjet inks. Based on characteristic absorption bands in IR, the inks were classified into a few distinct groups. The obtained spectras and all the available information could be used to create a database and could be applied to actual case work due to very good sensitivity and reproducibility of the technique. An attempt has been done to give the ink profiling of inkjet printing inks. The technique is destructive in nature but it will provide a great helping held to the forensic community in the examination of cases related to inkjet printer inks.

Inkjet, Absorption, Refilled

 ** Presenting Author*