ABSTRACT

Forensic analysis of the photocopied documents is usually carried out to determine the nature, source and authenticity of the photocopied documents. Examination of photocopied documents considers all possible avenues that is, physical characteristics, defect marks and toner analysis to determine their nature and source. Sixty two black toners (both raw and processed) and 28 coloured and 10 raw samples have been examined for their physical and chemical characteristics to determine the nature and source of photocopied document. Collection of one hundred black and twenty coloured samples of the altered photocopies and their examination have also been carried for the identification of alteration in typed and printed materials, handwritten material and signatures of photocopied documents to determine the authenticity of the photocopied documents. Sixty two black samples have been classified into fifty two groups on the basis of physical characteristics, such as, toner type, fusion methods, splattering effect of the toner and trash marks. Sixty two black toners (both raw and processed) have also been classified into 34 groups on the basis of their chemical properties of the toners with combination of Thin Layer Chromatography, Ultraviolet (UV) Spectroscopy and Fourier Transform Infrared (FTIR) Spectroscopy. Twenty eight processed coloured samples have been examined for the Counterfeit Protection System (CPS) code and Toner Deposit Patterns. Twenty five, out of twenty eight coloured processed samples have been differentiated from each other on the basis of CPS code present on the surface while three samples could not be discriminated on the basis of CPS code. However, they have been fully differentiated from each other from their printing characteristics that is, Toner Deposit Pattern. Coloured samples have also been classified on the basis of their chemical analyses and almost all the processed and raw coloured samples (except two processed and four raw colour toners) have been discriminated from each other with combination of TLC, UV and FTIR. Alterations have
been detected in 37/100 (37%) black and 8/20 (40%) coloured samples, when all the features are collectively considered. However, when the generation of photocopies are increased, the detection of the alterations becomes difficult because recopying of the altered copy hide most of the characteristics of alterations. Duplication of the trash marks and the degree (percentage) of expansion of the strokes of the letter and baseline of printing from original upto 3rd generation considered as useful characteristic in the determination of the sequence of generation of the photocopied documents. The direction and extent of expansion have also been used to differentiate photocopiers.