B12 Latent Fingerprint Developing on Thermal Paper and Carbonless Paper

Mi-Jung Choi , Seung-Chan Roh, Man-Ki Kim, Yeo-ool Shin , Ki-Jung Paeng, PhD, and Sung-Woo Park, PhD, Department of Scientific Criminal Investigation, Chungnam National University, 305-764 and Department of Chemistry, Yonsei University, Wonju 220-710, KOREA*

After attending this presentation, attendees will learn a new technique for developing latent fingerprints on thermal and carbonless papers.

This presentation will impact the forensic community by demonstrating a new latent fingerprint method.

This presentation will show the results on the developing latent fingerprint from the thermal papers and carbonless papers. An understanding of the chemical and physical properties of these specialty papers is required to set up what possible method of processing will not damage. The thermal papers which were coated with coreactant, developer dyes, sensitizer and stabilizer would form an image on paper as breaking coreactant capsule by heat and successive reaction with developer dye. Sensitizers are solid phases that melt with heating, forming the reactant that brings the colorless dyes and coreactant together. Stabilizers reduce the reversibility of this reaction and permanently preserve the printed image within this coat. A few kinds of thermal papers of bank automatic teller machine itemize (ATM itemize), express way receipt, and mart receipt were examined. The carbonless papers which were coated with coreactant and developer dyes would form an image on paper as breaking coreactant capsule by pressure and successive reaction with developer dye. Carbonless paper consists of two or three pages coupled to produce a form in which minimum duplicate copies are created. The first page is termed the coated back (CB) and coated with microcapsule, original handwriting or machinery written pressure is directly applied. The next pages are termed the coated front (CF) and only the front of the page is coated (coreactant, CF-F) and the back of this is coated (microcapsule, CF-B). Three different carbonless papers of the contract form of real estate assignment, tax receipt and credit card receipt were examined. Latent fingerprint developing methods were set up by comparing DFO (1,8-diazafluoren- 9-one), iodine fuming methods and ninhydrine in various solvents (methanol, acetic acid, chlorofluorocarbon [CFC], hydrofluoroether [HFE]).

The found the damage of thermal paper as blackening the paper itself and handwriting document by applying polar solvent. The damage of bleeding or running was relatively light at the application of CFC or HFE solvent than polar solvent, but it was unreadable. However, the presence of a fingerprint could be confirmed from the fresh and one week old latent evidence using the iodine fuming method. In the case of non-coated surface, ninhydrine in HFE-7100 solvent shows the greatest development even in an one week old fingerprint, and thus successive treatment with iodine fuming for coated surface and ninhydrine in HFE-7100 for non-coated is the most effective method to identifying fingerprint in thermal papers. For CB of carbonless papers, ninhydrine in CFC113, for contract form of real estate assignment, ninhydrine in HFE 7100, for tax receipts iodine fuming followed by ninhydrine in CFC113 for credit card receipt were the most effective methods. In case of CF-F, iodine fuming method. After verifying the kind of papers by SEM and FT-IR prior to applying specific development methods, the most efficient methods of latent fingerprinting developing on specialty papers, with minimal change on paper have been set up.

Thermal Paper, Carbonless Paper, Latent Fingerprint

 ** Presenting Author*