



B149 Analysis and Discrimination of Colored Pressure-Sensitive Tape Backing by Microspectrophotometry

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The goal of this presentation is to present the results from a research project of absorbance microspectroscopy of red and blue pressure-sensitive tape backings.

This presentation will impact the forensic science community by showing the potential of Microspectrophotometry (MSP) as a method for differentiation of colored tape backings.

Tape is often used in the commission of a crime. Electrical tape can be used in improvised explosive devices while duct tape is often used to bind victims. Pressure-sensitive tape contains several components including, at minimum, an adhesive layer and a backing layer. A variety of colored and patterned tape backings is becoming more readily available. This variety of colors may offer another area of discrimination in the forensic analytical scheme.

MSP is the analysis of color in the visible range on a small scale. MSP is a well-accepted technique used in the analysis of trace evidence such as paint and fibers. Very little literature has been found on the MSP analysis of colored tape backings and no literature was found on how discriminating the MSP could be with tapes of the same color. The current study was performed to evaluate the usefulness of MSP to be used in conjunction with other analytical schemes in the forensic analysis of colored tape backings.

This study involved two different colors (red and blue) of pressure-sensitive tape in a variety of types (duct tape, electrical tape, and miscellaneous tape). Most tapes were purchased at local stores and were sold for general use. In this study, 18 red duct tape samples, 18 blue duct tape samples, 11 blue electrical tape samples, 8 red electrical tape samples, 12 red miscellaneous tape samples, and 5 blue miscellaneous tape samples were analyzed in this study.

The project was designed with the following objectives in mind: (1) to determine if the MSP could discriminate similar colored tape backing; (2) to determine if the MSP would add to the analysis scheme of physical characteristics and Fourier Transform Infrared (FTIR) analysis; and, (3) to determine the inter-variability of MSP results in a single roll of duct tape and electrical tape.

Tape samples were cross-sectioned using a microtome and analyzed using the CRAIC 20/20 PV™ MSP in replicates of five, minimally. Tapes were only compared within their same color and tape type groups and blind replicate samples were also included in the comparison groups. In addition, the same tape samples were evaluated based on physical characteristics (size, backing structure, adhesive color, and scrim, if applicable) and Infrared (IR) spectroscopy. The results of the discrimination of colored tape backings by MSP and how MSP adds additional discrimination to the traditional analysis scheme (physical characteristics and IR) will be discussed.

Duct Tape, Electrical Tape, MSP