Thesis Title Detection of Gunshot Residues on Hands by Scanning Electron Microscopy/Energy Dispersive X-ray Spectroscopy (SEM/EDX)

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ABSTRACT

Detection of gunshot residues on hands is one of the most important phase of scientific crime detection. There are several methods of the gunshot residues detection generally available. Each method has its own share of advantages and disadvantages. NAA and AAS use a bulk quantitative elemetal analysis approach which measures total content of Barium and Antimony (NAA) or Barium, Antimony and Lead (AAS) that has been collected from specific regions of the hands, while scanning electron microscopy employed with energy dispersive x-ray spectrometry (SEM/EDX) is potentially superior because it characterizes individual gunshot residue particles both morphologically and elementally so that SEM/EDX is a widely known method used for the detection of gunshot residue particles in many countries. In the present work, it was demonstrated that unique gunshot residue particles are consistently and correctly identified by this method on samples taken more than 6 hours after firing (up to 10

hours) and was described the morphology, size and kinds of elements. It was therefore decided to attempt to develop a technique for the detection of all of elements which is rapid, specific, simple and relative inexpensive so that is can be used for fast screening of suspected hands. This study is the first of its kind in Thailand, and the result of which will be of great benefit to the Scientific Crime Detection Division, Royal Thai Police.