GUNSHOT RESIDUE INVESTIGATIONS WITH TXRF

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Gunshot residue (GSR) examination is a specialized discipline of forensic science. Techniques for examining GSR have evolved from simple color tests to modern analytical methods. As TXRF is a powerful analytical method for investigation of samples with very small amount of sample required, the investigation of GSR seems to be a suitable application.

In cooperation with the Landeskriminalamt Wien three shot experiments have been performed. The changeable degrees of freedom have been:

- weapon configuration: different weapons with different ammunitions
- geometric arrangement: along and beside the projectile trajectory
- collection devices: different sample carrier materials (e.g. Si-Wafer, SiO2-Reflectors, …)

The common investigation of GSR is realized with scanning electron microscopy. EDX is often performed beside the SEM. The major question of this research is to verify whether TXRF is able to provide new results. In particular if it is possible to create a "finger print" of the weapon configuration used. With this it could be possible to establish a data bank of weapon configurations being used by the police to assist crime scene investigation.

Due to the lower detection limits compared to EDX it has to be answered if the distance between muzzle and detectable GSR can be enlarged. Do all elements in the GSR show the same special distribution?