

USE OF X-RAYS IN THE UNITED KINGDOM FORENSIC SCIENCE SERVICE

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X-ray techniques, just as many other analytical methods, have been used in forensic science for several decades. The main applications of X-rays in the UK Forensic Science Service are in X-ray powder diffraction (XRD), X-ray fluorescence (XRF) and X-radiography.

The need for non-destructive methods of analysis in order to preserve evidence can be of great importance, although this requirement may vary from country to country depending upon the prevailing criminal justice system. Most courts understand, and accept, that chemical analysis can result in destruction of a specimen, but in certain instances, Counsel may insist on seeing the specimen that was analysed, and having that same specimen re-analysed by their own scientists. In view of this, it is wise to use non-destructive analytical methods, where possible, as a matter of course. XRD, XRF and Radiography meet this requirement admirably.

The complementary techniques of XRD and XRF are used mainly in contact trace analysis. So-called contact traces (paint flakes, glass fragments, hair and fibres (natural and man-made), slivers of metal, soils, building materials, stains of any description, corrosion products and loose powdered materials) appear in the traditional areas of forensic science. Identification and comparison of trace quantities of material can help in the conviction or exoneration of a person suspected of involvement in a crime. Drugs sold at street level in small quantities, and those seized in kilogram quantities can also be identified, together with their adulterants, by XRD. X-radiography has a role in the examination of a wide variety of objects, from thin, low-density objects such as documents using soft X-rays, to more dense objects using harder X-rays and electronography.