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Nuclear Material Families –An Extension to is it DU, NU, LEU or HEU?

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One of the simplest categorisations of nuclear material is to state that a uranium sample is depleted uranium (DU), natural uranium (NU), low enriched uranium (LEU) or high enriched uranium (HEU). Such categorisation is useful from an accounting, authorisation, or transport point of view, but of limited use in a Nuclear Forensic Science Investigation.

A full isotopic characterisation of a sample will confirm which of the above four families the analysed material sits in –DU, NU, LEU or HEU –however the full analysis data will allow more specific comments to be made about the physical processes that the analysed material has previously been subjected to in terms of enrichment, or irradiation deduced from the laws of Physics, or, when related to the civil industry, economics.

The paper will show examples of the sub-division of the four main categories of uranium into smaller families using examples drawn from the open literature. The materials used for illustration will include standard reference materials, data from previous nuclear forensic science cases, operating practices from the nuclear industry, and other scientific reports from the open literature.

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