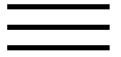


Inspections for contraband in a shipping container using fast neutrons and the associated alpha particle technique: Proof of principle.

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Inspections for contraband in a shipping container using fast neutrons and the associated alpha particle technique: Proof of principle

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Abstract

Gamma rays produced by scattering of 14 MeV neutrons with detection of associated alpha particles were used for determination of object location in a shipping container. It is shown that is possible to locate an object's position inside the container and, in some cases, also obtain some compositional information (at least carbon and oxygen in TNT). The movement of the peak in the time spectrum corresponds to the change of the object location in the container. Carbon was successfully identified together with its position in the container, even behind 5.1 cm thick iron slabs which is impossible to be seen by an industrial 300 keV X-ray radiographic system. Also, 7.5 kg of TNT was

successfully identified inside containers filled with soil.



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PACS

25.40.Fq; 29.40.M; 82.80.Ej

Keywords

The associated alpha particle method; Gamma spectroscopy; Container inspections; Fast neutrons

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