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## Application of tagged neutron method for detecting diamonds in kimberlite.

Tagged neutron method is a non destructive technique of analysing the chemical composition of a material using fast neutron. This technique can be applied in diamond mining industry to separate diamond bearing kimberlite from the barren ores before the secondary crushing of the ore to avoid damaging diamond. It allows detecting diamond within the kimberlite without crushing the ore. The ore is irradiated with fast neutrons of energy 14.1 MeV which excites kimberlite elements. These elements de-excite through the emission of characteristics gamma rays. Diamond is mainly carbon. Carbon forms peaks at 3.9 and 4.4 MeV, therefore diamond detection is the detection of excess carbon in some regions of the ore. It can detect diamonds in an ore 10 times larger than the size of diamond.

### Apply to be considered for a student ; award (Yes / No)?

Yes

### Level for award;(Hons, MSc, PhD, N/A)?

MSc

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