

Investigation of shielding parameters of some boron containing resources for gamma ray and fast neutron

ABSTRACT

Mass attenuation coefficient (μ) of some boron containing resources in China were investigated in the paper at 0.001–20 MeV through XCOM and Geant4. What's more, half value thickness layer (HVL), mean free path (MFP), effective atomic number (Z_{eff}) and electron density (N_e) were calculated. In addition, fast neutron removal cross sections of these resources were calculated by partial density method. It has been found that Boron bearing iron concentrate has the maximum μ , Z_{eff} , N_e and ΣR , and its HVL and MFP are lowest. The investigation would be useful for potential application of the boron containing resources in the field of neutron and gamma ray shielding materials.

Keyword: Boron containing resources; Gamma ray; Fast neutron; Shielding parameter; XCOM; Geant4