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## Shielding properties of the ordinary concrete loaded with micro- and nano-particles against neutron and gamma radiations

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### Abstract

The shielding properties of ordinary concrete doped with some micro and nano scaled materials were studied in the current study. Narrow beam geometry was simulated using MCNPX Monte Carlo code and the mass attenuation coefficient of ordinary concrete doped with PbO<sub>2</sub>, Fe<sub>2</sub>O<sub>3</sub>, WO<sub>3</sub> and H<sub>4</sub>B (Boronium) in both nano and micro scales was calculated for photon and neutron beams. Mono-energetic beams of neutrons (100-3000 keV) and photons (142-1250 keV) were used for calculations. The concrete doped with nano-sized particles showed higher neutron removal cross section (7%) and photon attenuation coefficient (8%) relative to micro-particles.

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