



نموذج (I) : بيانات بحث مقدم للترقية

البحث الثاني – مشترك (تم التحكيم بذات اللجنة شهر نوفمبر 2020)

1- عنوان البحث

عنوان البحث
Optimizing the shielding properties of strength-enhanced concrete containing marble

2- البيانات الخاصة بالنشر

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5- ملخص البحث باللغة الإنجليزية

The purpose of this study is to develop a low cost, locally produced concrete mixture with optimum marble content. The resulting mixture would have enhanced strength properties compared to the non-marble reference concrete, and improved radiation shielding properties. To accomplish these goals \_ve concrete mixtures were prepared, containing 0, 5, 10, 15 and 20 % marble waste powder as a cement replacement on the basis of weight. These samples were subjected to a compressive strength test. The shielding parameters such as mass attenuation coefficients ( $\mu_m$ ), mean free path (MFP), effective atomic number ( $Z_{eff}$ ) and exposure build-up factors (EBF) were measured, and results were compared with those obtained using the WinXcom program and MCNPX code in the photon energy range of 0.015 - 3 MeV. Moreover, the macroscopic fast neutron removal cross-section (neutron attenuation coefficient) was calculated and the results presented. The results show that the sample containing 10 % marble has the highest compressive strength and potentially good gamma ray and neutron radiation shielding properties.