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2 - Determination of Activity Concentrations in Selected Rock Samples from Quarry Sites in Ibadan, Nigeria

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Measurement of natural radioactivity in rock is very important to determine the amount of change in the natural background activity with time as a result of any radioactive releases. It is very important to monitor radioactive substances released to the environment for proper environmental protection. The aim of this work is to investigate the concentration of radioactive substance in selected rock samples in a quarry site in Ibadan for the purpose of safety assessment.

Fifteen rock samples, each of mass 1kg were collected from the quarry site in Ibadan and then hammered into pieces before being crushed into very ne grain. The desired samples were then stored in polythene sachets for 28 days so as to reach secular equilibrium. Samples were thereafter taken to the Nuclear Physics Laboratory for counting and analysis. The gamma analysis was performed on a 76mm X 76mm Sodium Iodide (Thallium doped) NaI (TL) scintillation counter detector photomultiplier. Results obtained showed that the ranges of the activity concentrations of 40K, 238U, 232Th in the rock samples are 87:058:46 to 174:452:56, 8:251:46 to 21:351:25 and 1:020:32 to 10:63 0:71Bqkg⊠1. Activity concentrations obtained are less than that of United Nations Scientic Committee on Eects of Atomic Radiation Report (UNSCEAR) report 2000 which indicated the worldwide activity concentration of 40K, 238U and 232Th within the ranges 140-850, 17-60 and 11-64Bqkg⊠1 and mean 400, 35 and 30Bqkg⊠1 respectively. Keywords: Natural Radioactivity, activity concentration, secular equilibrium, rock samples 1Lead City University, Ibadan

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