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Assessment of Some Local Clay Minerals Used for the Production of Floor Tiles: Panacea for Economic Growth

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Abstract : The suitability of some clay deposits in south eastern Nigeria (Unwana, Ekebedi and Nsu) as materials for the production of floor tiles was investigated. The clay samples were analyzed using wet classical method to determine their chemical composition. Floor tile test specimens were produced using standard method. The test specimens were tested for physical properties such as compressive strength and porosity at 1050◦c and 1150◦c temperature levels. The chemical analysis showed the following results: Unwana (5102 52.24%, AL2o3, 27.20%, Fe2o3 7%, T102 (1.52%), Ekebedi (S102 (58.53%), Al2o3 28.42%, Fe2o3 7%, Ti o2 (1.12%),NSU SIo2 (58.16%), Al2O3 (28.42%), Fe2O3 1.89%, T102 (0.82%) The compressive strength of Unwana, Ekebedi and Nsu clays at 1050◦c are respectively: 15MPa, 13.75MPa and 13.5MPa. At 1150◦c, the values are 16.2MPa and 16.0MPa for Ekebedi and Nsu clays respectively. The porosity of Unwana, Ekebedi and Nsu clays at 1050◦c are respectively31.57%, 23.15% and 24.21%. At 1150◦c, the values are 23.65% and 24.75% for Ekebedi and Nsu respectively. The three clays can be used for production of tiles but Ekebedi has the highest compressive strength which makes it the most suitable clay for the production of floor tiles when compared with floor tiles of the same nominal size stipulated by ASTM standard.

Keywords : feldspar, quartz, porosity, compressive strength, clay minerals
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