

Characterization of Tailings From Traditional Panning of Alluvial Gold Ore (A Case Study of Ilesa - Southwestern Nigeria Goldfield Tailings Dumps)

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Abstract : Field observation revealed a lot of artisanal gold mining activities in Ilesa gold belt of southwestern Nigeria. The possibility of alluvial and lode gold deposits in commercial quantities around this location is very high, as there are many resident artisanal gold miners who have been mining and trading alluvial gold ore for decades and to date in the area. Their major process of solid gold recovery from its ore is by gravity concentration using the convectional panning method. This method is simple to learn and fast to recover gold from its alluvial ore, but its effectiveness is based on rules of thumb and the artisanal miners' experience in handling gold ore panning tool while processing the ore. Research samples from five alluvial gold ore tailings dumps were collected and studied. Samples were subjected to particle size analysis and mineralogical and elemental characterization using X-Ray Diffraction (XRD) and Particle-Induced X-ray Emission (PIXE) methods, respectively. The results showed that the tailings were of major quartz in association with albite, plagioclase, mica, gold, calcite and sulphide minerals. The elemental composition analysis revealed a 15ppm of gold concentration in particle size fraction of -90 microns in one of the tailings dumps investigated. These results are significant. It is recommended that heaps of panning tailings should be further reprocessed using other gold recovery methods such as shaking tables, flotation and controlled cyanidation that can efficiently recover fine gold particles that were previously lost into the gold panning tailings. The tailings site should also be well controlled and monitored so that these heavy minerals do not find their way into surrounding water streams and rivers, thereby causing health hazards.

Keywords : gold ore, panning, PIXE, tailings, XRD

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