

## Speciation of Selected Heavy Metals in Some Abandoned Mining Pond Sediments of Barkin-Ladi Lga, Plateau State Nigeria

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Industrial and anthropogenic activities have resulted in high levels of heavy metal contents in some environmental aquifers such as mining abandoned ponds in like that in Barkin-ladi, thus creating imbalance in the biotic and abiotic regimes of the ecosystem. This study reveals the level and concentration of some selected heavy metals in the mining ponds which includes Cadmium (Cd), Chromium (Cr), Nickel (Ni) and lead (Pb). Sediment samples from these selected ponds were obtained and various fractions of the elements were produced by sequential extraction of the sediment samples using the modified Tessier et al (1979) procedures. Concentrations of these heavy metals were determined using Microwave Plasma Atomic Emission Spectrophotometer (MP-AES), Agilent 4210. The results obtained showed that Lead and Cadmium were present in all the sites and fractions except for Cd were it was very low in all sites. Mean value were in the order of  $Pb > Cd > Ni > Cr$  with mean concentrations (mg/kg) of  $Cd = 0.023 \pm 0.003$ ,  $Cr = 0.004 \pm 0.002$ ,  $Ni = 0.008 \pm 0.002$ ,  $Pb = 0.136 \pm 0.007$ . Results also indicated that Cd and Cr are predominantly available in all fractions 1 – 9 and 3 respectively. Cd and Pb shows significant positive correlation, indicating likely existence either as similar specie or same point source. The presence of Lead in all sample sites shows that Lead is possibly associated with Tin, since study areas were all abandoned tin mining site. The research generally reveals that the heavy metals determined were in potentially available forms that could pose serious health problems to the agricultural and aquatic systems, especially Pb, Cd and Cr. Consistently, handfals are harmed or murdered in recreational mishaps on mine property. Most of the passings are disconnected to mine investigation, nonetheless. Drownings in open quarries and ATV mishaps on relinquished mine properties are the primary driver of unintentional passing. The U.S. Branch of Labor takes note of that since 1999, "in excess of 200 individuals have passed on in recreational mishaps at surface and underground dynamic and deserted tasks across the country." Due to these conditions, the Mine Safety and Health Administration dispatched the "Remain Out – Stay Alive" crusade, which is a public mindfulness crusade pointed toward notice and instructing kids and grown-ups about the risks of investigating and playing on dynamic and surrendered mine locales. It tends to be dangerous and hindering to dwell near a surrendered coal mining site. The Surface Mining Control and Reclamation Act was passed in 1977 out of two sections; one to control impacts of dynamic mines, and one to direct

surrendered mines. SMCRA likewise started a relinquished mine territory store, in which an expense was charged for every huge load of coal delivered. This income was appropriated to a limited extent to the United Mine Workers Association (UMWA) towards retirement assets, just as to the Office of Surface Mining Reclamation and Enforcement (OSMRE) to proceed with tasks. There is still around \$2 billion in assets that are undistributed hitherto.