

CURRENT RESEARCH

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The economic mineral resources of a nation have over the years formed major economic backbone of such countries. The level of industrialization of a nation depends to a very large extent on its mineral endowments. The application of geological principles in the discovery, characterization, evaluation and genesis of these deposits is therefore the basic fulcrum for evaluation of these mineral endowments.

The recent resurgence of interest in the solid minerals sector of the Nigerian economy is a major impetus for research into the nation's economic mineral endowment in relation to Global Perspectives.

The Research Focus has been on the understanding of compositional features, petrogenesis of basement complex and sedimentary hosted ore deposits and industrial minerals and their lithological associations. Also, the compositional and petrogenetic features of the host rocks comprising gneisses, migmatites, quartzites, schists, Older granites, pegmatites and secondary rocks such as amphibolites, banded Iron Formation are foci of the research.

This research efforts have thus led to evaluation of ores of rare metals -tantalite, tin, columbite and wolframite within the pegmatite, often associated with meta sedimentary, meta volcanic and rocks. Industrial minerals which are as a result of hydrothermal, epigenetic or residual weathering processes such as Clays, Gypsum, and Phosphate brine salts have also been studied.

Recent research efforts are also geared towards using inorganic geochemical methods to characterize Nigeria's sedimentary basin and evaluate their lithologic successions for industrial raw materials.

a) Completed

- i) Compositional features of amphibolites of Burum area
- ii) Petrogenesis of Meta sedimentary rocks of Lokoja – Jakura Schist belt
- iii) Process test work for recovery of tantalite – columbite concentrates of Nasarawa area central Nigeria.
- iv) Compositional features and industrial appraisal of Baba Ode talc deposits.
- v) Rare metals potentials of Nigeria.
- vi) Synoptic survey of some alternate industrial usage of Nigerian Carbonate deposits.
- vii) Agrogeological studies of phosphate, limestone and gypsum occurrence in the Dahomey Basin

- viii) Industrial appraisal of Marble deposits
- ix) Prospects for investment in mineral resources of Southwestern Nigeria.
- x) Geochemical evaluation of rare metal Ta-Nb pegmatites of Nigeria.
- (xi) Metallogeny of Precambrian pegmatites of Nigeria.
- xii) Compositional features of Rare metal pegmatites of Lema – Share area
- xiii) Trends of rare metal mineralization of Ada – Aramoko – Ijero area.
- xiv) Evaluation of Sepeteri Tantalum deposit
- xv) Composition and Industrial appraisal of Itakpe clay deposit.
- xvi) Petrogenetic studies of metasedimentary belts of south west Nigeria around the Okemesi fold belt and Esie areas

b) In Progress

1 Compositional and Industrial assessment of Ijero Kaolinitic Clay Occurrences ,southwestern Nigeria.

This study which started in 2007/08 session is aimed at studying the clay occurrences around Ijero area with a view to assess their suitability as industrial raw materials for ceramics, glass, brick and refractory industry. The study will involve systematic geological mapping, the determination of mineralogical, chemical and geotechnical properties of these clay occurrences.

2 Geochemical features and mineralization potentials of pegmatite hosted Mineralisation around, in Ijero area, southwestern Nigeria.

Regional geological mapping on varied scales have revealed the existence and occurrence of Pegmatite bodies around Ijero area. Pegmatites are known to host a variety of secondary mineralization including metallic and industrial minerals. This on going research focuses on the compositional characteristics and genesis of these bodies. The rare metal potentials especially in relation to Ta-Nb Mineralisation will be studied. The results are expected to reveal possible potentials of economic mineralization ,extent and resource of the associated mineralization.

3 Assessment of shale deposits in Nigeria’s sedimentary basins as raw materials in Industry.

Shales have been established through many studies of the Nigerian inland sedimentary basin, to be a major rock unit of these basins. Shales which are essentially composed of clayey minerals have also been known to be a veritable industrial raw material for ceramics, refractory, and cement industries. However as abundant as this lithologic unit is, it has not been assessed for its raw materials potentials. Hitherto, most studies have been on its hydrocarbon source rock potentials. This ongoing research is therefore focusing on shale sequences of the Dahomey basin, southwestern Nigeria, Bida basin, central Nigeria and Sokoto Basin, northwestern Nigeria with a view to assess their suitabilities for industries.

4 Inorganic geochemical studies of shale and claystones of Nigeria’s Inland basins

Most of the studies on the geochemical characterization of shale strata of Sedimentary basins of Nigeria have focused mainly on the organic aspects. This research effort therefore concentrates on using inorganic geochemical features mainly, major, trace, and rare earth elements to elucidate the provenance, tectonics and depositional features, history and diagenetic characteristics of the shale sequences of Mid Niger basin, Sokoto basin and Dahomey basin of Nigeria.

5 Platinum Group Elements (PGE) mineralization potential in Nigeria’s ultramafic complex

There has not been a record of a systematic search for occurrence of Platinum Group Elements PGE in Nigeria. PGE are one of the most valuable metallic elements with specialized and strategic usage in industry. They belong to the group referred to as precious metals. There has not been any previous systematic search for this group of elements in Nigeria. This ongoing research effort seeks to study the Nigeria's ultramafic belts, especially concentrating on the suture zones of the Nigeria's transcurrent fault system mainly in the western half of Nigeria. This is with a view to elucidate their PGE composition.

C) DISSERTATION AND THESIS

1) Geology and Engineering Geological Characterization from Jebba B.Sc Dissertation University of Ilorin, Nigeria. 1982, 81p.

2 Geology, heavy mineral and geochemical surveys for Sn – Ta mineralization in Jemma sheet 188 SE. M.Sc. Thesis Ahmadu Bello University Zaria, Nigeria. 1991, 100p.

3. Geological and Compositional investigation of Precambrian Marble bodies around Burum and Jakura areas, Central Nigeria. PhD Thesis, 2001