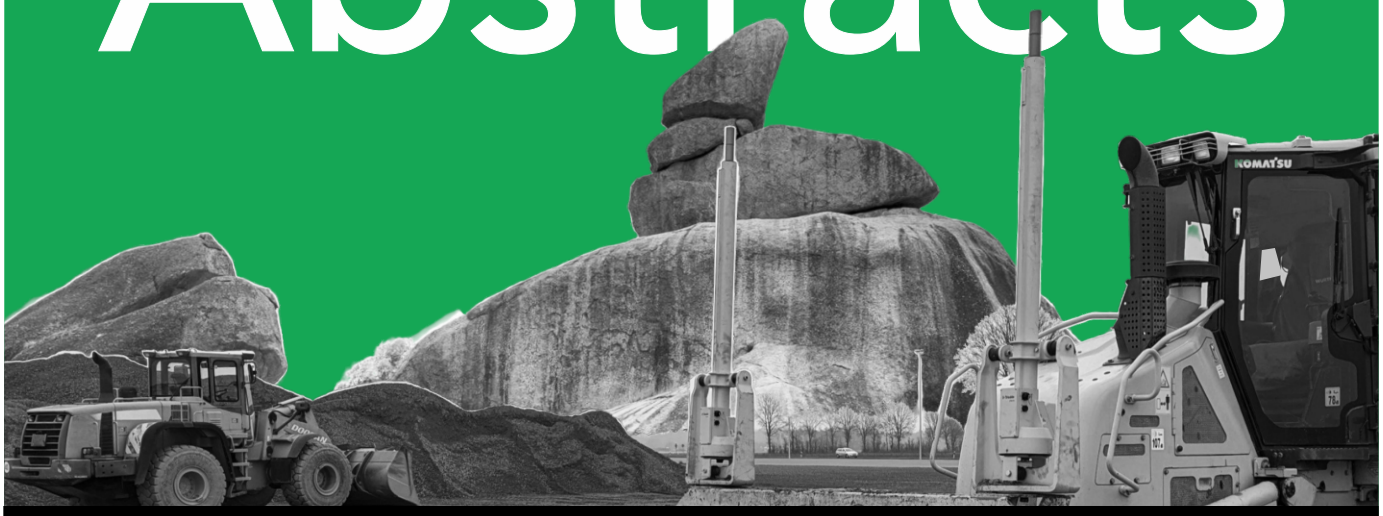
NIGERIAN MINING & GEOSCIENCES SOCIETY (NMGS)

JOS TIN CITY 2024

59th Annual International Conference & Exhibition

Book of Abstracts



THEME

EMERGING GLOBAL PERSPECTIVES, TRENDS & SUSTAINABLE DEVELOPMENT OF MINERALS & ENERGY RESOURCES

NMGS NATIONAL MUSEUM & LIASON OFFICE, JOS, PLATEAU, NIGERIA

17TH - 22ND MARCH, 2024

THE WORLD BANK IBRD • IDA | KURSI GROUP | NNPC | ZOTMANN INTERNATIONAL LIMITED | Nigerian Mining Cadastre Office | ASTRO MINERALS LIMITED | CONTINENTAL | TITAN MINERALS LTD | Deep-time Digital Earth | Coltan Metals and Minerals Nigeria LTD

CONTENTS

MINERAL EXPLORATION, GEOLOGY, GEOCHEMISTRY, ECONOMIC GEOLOGY (contd.)

	TITLE	ID	AUTHOR(S)	PAGE
GCH	PETROGENETIC CHARACTERIZATION OF THE BASEMENT COMPLEX ROCKS IN THE BAGEL AREA, NORTHEASTERN NIGERIA	113	Abba A. A.; Hamman I. K.; Usman A. U.; El-Nafaty J. M.; Baba S.	39
GCH	MAJOR AND TRACE ELEMENTS GEOCHEMISTRY OF SHALES AND CLAYS IN OWUTU AREA AFIKPO SUB-BASIN, SOUTHEASTERN NIGERIA	115	Ideozu, R. U., Chiazor, F. I., and Soberekon, S. B	40
GCH	TRACE ELEMENT AND RARE EARTH ELEMENT GEOCHEMISTRY OF SHALES AND CLAYS FROM THE OWUTU AREA IN AFIKPO SUB-BASIN SOUTH EASTERN NIGERIA	116	Ideozu, R. U., Chiazor, F. I. and Johnbull, B. I.	41
GCH	GEOLOGICAL STUDIES AND GEOCHEMICAL CHARACTERIZATION OF ROCKS AND TOP-SOILS OF NDABLAMA, SOUTHWEST LIBERIA	126	Maxwell D. Gruway; Felicia F. Ajayi; Tesleem Kolawole	42
GCH	GEOLOGY AND GEOCHEMISTRY OF LEAD-ZINC MINERALIZATION POTENTIAL OF THE MADA YOUNGER GRANITE, IN THE NORTHERN PART OF WAMBA SHEET 210 SW, NORTHCENTRAL NIGERIA	142	Nyajon Kubuza Caleb, Tavershima Najime, Ismail Yusuf Abubakar, Dominic Adode Loyal, and Atari Yunana Ayiwulu	43
GCH	COMPOSITIONAL FEATURES AND TA-SN-NB RARE METAL MINERALIZATION POTENTIAL OF OGODO-ODOBOLA PEGMATITE, CENTRAL NIGERIA	148	Omanayin, Y. A., Waziri, N. M., Onoduku, U. S., and Alabi, A. A.	44
GCH	GEOCHEMISTRY OF TERMITE MOUNDS IN THE SEDIMENT-HOSTED LEAD-ZINC MINING DISTRICT OF YOLO, GONGOLA SUB-BASIN: A GUIDE FOR LEAD-ZINC EXPLORATION IN THE UPPER BENUE TROUGH, NIGERIA	158	Haruna, I.V., Ahmed, H.A., Suleiman, B.M.	45
GCH	PETROGENESIS OF PAN-AFRICAN GRANITOIDS FROM HAWAL MASSIF, NORTHEASTERN NIGERIA: INSIGHT FROM MINERAL CHEMISTRY	160	Saleh Ibrahim Bute, Musa Bala Girei, Raymond Tabale Peter, Auwalu Dalha	46
GCH	PETROGENETIC CHARACTERISATIONS OF ROCKS OF MAMA AND MASSENGE PART OF SHA-KALERI YOUNGER GRANITES COMPLEX, NORTH CENTRAL NIGERIA	213	Nimchak Rindap Nanmwa, Nimze Lohfa Wuyep, Isah Bunyaminu	47

NIGERIAN MINING & GEOSCIENCES SOCIETY (NMGS)

59th Annual International Conference & Exhibition

148

COMPOSITIONAL FEATURES AND Ta-Sn-Nb RARE METAL MINERALIZATION POTENTIAL OF OGODO-ODOBOLA PEGMATITE, CENTRAL NIGERIA

Omanayin, Y. A., Waziri, N. M., Onoduku, U. S., and Alabi, A. A.

Department of Geology, Federal University of Technology, P. M. B. 065, Minna, Niger State, Nigeria
Corresponding author's email: o.adinoyi@futminna.edu.ng Phone No.: +2348038388110

Abstract

Large pegmatite bodies are abundant in Ogodo-Odobola area. They occur in tabular forms and concordant to discordantly intruding the host rocks of migmatitic gneiss, schist and granite. This research is aimed at assessing the geochemical characteristics of pegmatite in the Ogodo-Odobola area to evaluate their rare metal potential. Field investigation was undertaken to determine the occurrences and relationships of the pegmatites with the host rocks. Thirty-three (33) fresh pegmatite samples were analysed using X-Ray Fluorescence (XRF), Inductively Coupled Plasma Optical Emission Spectrometry (ICP OES) and Inductively Coupled Plasma Mass Spectrometry (ICPMS) techniques at the National Geoscience Research Laboratory, Kaduna and the Activation Laboratories Ltd. (Actlab), Ontario, Canada respectively. Major oxides in the whole rock pegmatite show that they are of siliceous (SiO_2; 72.82 wt.% average) and peraluminous (Al_2O_3; 16.78 wt.% average) composition. The K_2O, Na_2O and Fe_2O_3 contents average 4.81 wt.%, 3.13 wt.% and 1.27 wt.% respectively while CaO, MnO, MgO, TiO_2 and P_2O_3 are each less than 1.0 wt.%. Average values of trace elements in the pegmatite are Ta (12.40 ppm), Sn (18.36 ppm), Nb (94.51 ppm), Be (16.14 ppm), Rb (480.23 ppm), U (12.47 ppm), Cs (17.14 ppm), Ga (39.91 ppm), Ge (3.91 ppm), W (4.81 ppm), Li (40.98 ppm), Mn (890 ppm) and B (18.96 ppm). Ratios of diagnostic elements of K/Rb (75.21 ppm), K/Cs (3348.39 ppm), Rb/Sr (25.55 ppm), Rb/Cs (37.18 ppm), Ta/W (2.78 ppm), Nb/Ta (8.81 ppm), Ba/Rb (0.07 ppm) indicate a moderate index of fractionation. A/CNK >1 and Al_2O_3>CaO+Na_2O+K_2O with enrichment of SiO_2, Al_2O_3, Na_2O, K_2O and depletion of Fe_2O_3, MnO and MgO suggests that Ogodo-Odobola pegmatite is of peraluminous bulk composition and plots of A/NK versus A/CNK and Rb versus (Y+Nb) discriminates the pegmatite in the peraluminous Lithium-Caesium-Tantalum (Li, Rb, Cs, Be, Ga, Nb Ta, Sn, B, Ge, U, W) of syn-collisional to within plate granitic family. The plots of Ta versus Cs, Ta versus Ga, Ta versus (Cs+Rb) and Be versus K/Nb, with over 70 % of the samples plotting below the Beus line and 100 % below the Gordiyenko line reveal that the pegmatites from the study area are barren to marginally mineralized in rare metals (Ta>Sn>Nb).

Keywords: *Pegmatite, Siliceous, Peraluminous, Rare metal, Syn-collisional*

NIGERIAN MINING & GEOSCIENCES SOCIETY (NMGS)

2024

www.nmgs.org.ng