

The Geochemistry and Geochronology of the Kassa Volcanic Field (KVF) in Jos Plateau North Central, Nigeria

MOHAMMED S. TSALHA¹ AND U.A LAR²

¹Centre for Geodesy and Geodynamics, Toro,
National Space Research and Development
Agency (NASRDA)

Nigeria, mohtsalha@gmail.com

²Department of Geology and Mining, University of
Jos, Nigeria, ualaxanderlar@yahoo.co.uk

The Kassa Volcanic Field (KVF) is located on the Jos Plateau in the north central Nigeria. The petrographic studies and microprobe analysis of the basaltic rocks in thin - section revealed the presence of plagioclase laths and magnetite in groundmass, olivine (forsterite), clinopyroxene (diopside and augite), plagioclase phenocrysts (labradorite) and magnetite and /or ilmenite. In some of the samples at the northeastern part of KVF, some of the olivine crystals are altered from rim to the core (iddingsite), the state of alteration is prominent in the Older Basalt than in the Newer Basalts. The mineral phases in these basaltic rocks were further confirmed through the Scanning Electron Microprobe and the Electron Microprobe Analysis where a mineral morphology and analysis of minute portion in microns were carried out in some selected 15 samples deducted from this study. The Geochemical analysis conducted on 30 basaltic rock samples shows that they are alkaline- sub-alkaline magma series in a non-oceanic geotectonic environment. The chondrite normalized patterns of the Rare Earth Elements (REEs) are parallel to subparallel and generally uniform signifying that the magma series are of the same source. The geochronological studies of eight basaltic rocks revealed a partial progressive age increment from the northern extremity to the southern end of the KVF. The ages range from 1.97Ma, 1.66Ma, 1.38Ma and 1.34Ma with an age intervals of about 0.2Ma for the first 3 volcanoes and intervals of 0.045Ma between the last two volcanoes. This suggests that the last eruption in the KVF could be younger than 25,000 years.