

# 3rd International Conference on Geology & Earth Science

April 10-11, 2019 Valencia, Spain

## Lithochemical Evaluation of Clayey Material of Soutpansberg Sediments Found in Vhembe District of South Africa: Implication for Provenance and Petrogenesis

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The Soutpansberg Group contains significant clayey sediments which are used for pottery and manufacturing of burnt bricks. The clayey sediments and rocks in Vhembe District were geochemically and petrologically evaluated to asseverate their local source areas to reconcile variation in properties of the clayey sediment. This paper presents the Paleo environmental reconstruction of Soutpansberg sediments while understanding their provenance and petrogenesis. To fulfill this objective, fresh samples of rock outcrops and clayey sediment were collected in 13 regions within the District. These samples were analyzed for their chemical content using XRF while the mineral composition of the rock samples were identified using an XRD spectroscopy and petrographic microscopy. The chemical index of alteration (CIA) value of clay samples was found to be homogenous and relatively high (73-94) compared to that of the rock samples (42-98) which were widely varied. The heterogeneous value of K/Cs found in rock samples with concentration  $>6500$  and  $<6500$  were consistence with their variable CIA values. The concentration of Ce\* element (1.0-3.2) in studied rock samples suggested an oxidizing environment while its anomalous low concentration ( $<1$ ) indicated anoxic environments which implied varied degree of reworked upper continental crust (UCC). Meanwhile the clay samples had the Ce\* concentration  $>1$  indicating oxidizing depositional environments. Both clay and rock samples were found to be having low Eu\* anomalies which were generally below 0.6. The tectonic discrimination based on Ti/Zr and La/Sc elemental ratio revealed that the petrogenesis of studied clayey sediments were mainly derived from mixture of weathering of the granitic, gneissic and basaltic rocks. The discrimination indicated that the clayey samples from Muk, Mas1, Mas2, Mas3, Dol and Lwa have their local source in the field of active continental arc while Sil, Nan, Mav, Man, Tsh, Mat and Thn plotted in continental Island margin corresponding to continental subduction rift zone of geochemical domain.

**Keywords:** Desilicication, CIA, provenance, UCC, Petrogenesis, Soutpansberg Group.