

SEG 2024 Conference: Sustainable Mineral Exploration and Development

Hypabyssal and Volcanic Rocks of the Western Foreland Shelf, Democratic Republic of Congo

James Yates, Amanda M. Stoltze

Ivanhoe Mines Exploration, Kolwezi, Democratic Republic of the Congo (Kinshasa)

The Western Foreland Shelf (WFS) of the Central African Copper Belt (CACB) in the Democratic Republic of Congo (DRC) is a sedimentary rift basin that can be traced from the DRC, through NW Zambia into Angola. The WFS is host to the Kamoa-Kakula Cu complex in the DRC and as such its evolution is of interest. Regionally extensive mafic intrusions and volcanic rocks are found along the length of the WFS and have been attributed to the onset of rifting.

The relative age for the volcanic mafic rocks has been established as prior to the onset of Nguba sedimentation at the western edge of the shelf and extending into early Nguba sedimentation on the eastern side of the shelf shown by the occurrence of peprites. Intrusive rocks have been harder to attribute to a relative age as they all occur prior to Nguba sedimentation but with an intrusive relationship to the Mesoproterozoic Kibaran basement.

Whole-rock geochemistry was used to characterise a range of hypabyssal and volcanic rocks found in the Western Foreland of the DRC also with a selection of hypabyssal and plutonic rocks from the adjacent Kibaran belt. The results of the geochemistry and thin section investigation identify the hypabyssal and volcanic rocks from the WFS as formed as part of an evolving magmatic sequence. The basalts have evidence of plagioclase fractionation identified by a negative Eu anomaly. The peperites from the eastern side of the WFS proximal to Kamoa also have a geochemical composition consistent with the basalts from the western edge of the shelf. Plutonic and hypabyssal rocks from the Kibaran basement have a more varied composition. Some consistent with the hypabyssal rocks of the WFS and some with significantly varied composition suggesting they were formed during different magmatic events.