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# The Aheimir Volcanic Suite (AVS) a bimodal Ediacaran Sequence from the northernmost Arabian Nubian Shield, Wadi Araba, SW Jordan: Age, Geochemistry and Petrogenesis.

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The petrogenesis of the Aheimir Volcanic Suite (AVS) is discussed on the basis of a large geochemical data set for 370 samples. The AVS is a NNE trending narrow belt (2 to 4 km wide) that extends to about 70 km along the eastern shoulder of central Wadi Araba-Dead Sea Transform fault (DST) from Feinan in the north to Gharandal in the south. The AVS is comprised of lava flows, ignimbrites, and pyroclastics dominated by lithic tuffs; agglomerates are also present. A variety of dikes ranging from simple to composite are abundant in the AVS. Based on the total alkalis-silica (TAS) classification, the investigated volcanics fall exclusively in the fields of basaltic trachyandesite, trachyandesite, trachyte/trachydacite, and rhyolites. They range from medium through high-K to shoshonites. The mafic to intermediate volcanics are typically alkali-calcic to alkali latites; whereas rhyolites are alkali feldspar and peralkaline rhyolites, namely, commendites.

Rb/Sr age determinations on rhyolites yielded ages between 530 to 553 Ma (Jarrar, 1992). This study provides new single zircon U-Pb ages from rhyolite flows and from latites and rhyolite of a composite dike. The ages range between 595 and 600 Ma which coincide with the intrusion of shallow level A-type granites and alkaline mafic magmas. The temperature of crystallization of these volcanics is constrained in this study to be between 750 and 1050 °C according to Zr thermometer.

The felsic members of the AVS occur both as holocrystalline flow-folded rhyolites to devitrified glasses. The latter are characterized by K-metasomatism where the $K_2O/Na_2O$ ranges from about 1 to 100; a phenomenon that have been already reported in these volcanics and their equivalent rocks in Sinai Peninsula. The nature of the fluids that brought about this metasomatism will is also discussed in this study.

The petrogenesis of these volcanics, which were formed at a stage marked the change from calc-alkaline to alkaline igneous activity in northernmost Arabian Nubian Shield. This change in chemical affinity of magmas could have been triggered by mantle delamination and a consequent rise of hot asthenosphere. This rise of hot asthenosphere resulted in decompressional melting of the upper mantle and the generation of mafic magmas. Emplacement and crystallization of these magmas at the mantle-crust boundary might have been responsible for the partial melting of lower continental crust and the generation of the rhyolites. On the other hand, the formation of latites is best explained by the assimilation and fractional crystallization model (AFC). Arguments that support the above conclusions are beyond the scope of this abstract and will be discussed in the presentation.