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MESOZOIC MAGMATISM IN TSAGAANDELGER AREA, CENTRAL MONGOLIA

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Tsagaandelger area is located in the southwestern part of the East-Mongolian volcano-plutonic belt, within the GobiUgtaal arch structure. Mesozoic magmatism in the Tsagaandelger area shows a wide distribution and is characterized by early-middle Triassic Tsagaandelger formation, middle Triassic Nomt complex and Tsagaanuul formation. Early-middle Triassic Tsagaandelger formation divided into four members, and composed mainly of trachyrhyolite, trachydacite, trachyrhyodacite, dacite, trachyte, pantellerite, comendite, trachyandesite and trachybasalt, fine grained trachysyenit-porphry, syenite-porphry. The Trachydacite member of the Tsagaandelger formation is high K series and alkaline rocks. They have similar silica contents ranging from 63.42 to 67.40wt %, higher Al₂O₃ ranging from 14.98 to 17.11 wt %, and total alkali content ranging from 9.34 to 12.36wt %. Chondrite-normalized REE patterns show enriched in LREE, and flat HREE pattern. Primitive mantle-normalized trace elements spider diagram shows enriched in LILE and depleted in HFS elements such as Nb, Th and Ti. Minerals from trachydacite are plotted on the well-defined Rb-Sr isochron of 241 Ma, indicating that the rocks were emplaced in early-middle Triassic. Rocks show low SrI (from 0.704608 to 0.705773) and NdI (0.512366 to 0.512536).

Middle Triassic Nomt complex crops out in west-northern part of the study area. It is composed of medium grained leicogranite, alaskite, aplite and dikes, and characterized by cupola structure known as Tsagaandelger cupola. Nomt complex are low K series and subalkaline rocks and characterized by peraluminous. The rocks show flat chondrite-normalized REE patterns with the strong Eu negative anomaly. Primitive mantle-normalized trace elements spider diagram of the granitoids shows enriched in LILE such as Rb, K and Th but depleted in Ba and HFS elements such as Nb, Sr. Granitoids plot on the well-defined Rb-Sr isochron of 231 Ma, indicate that rocks emplaced in the middle Triassic and show high SrI (0.709183 to 0.714445) and NdI (0.512380 to 0.512476) indicate that magma source was the partial melting of crustal material.

Lower Cretaceous Tsagaanuul formation consists of calc-alkaline and high K bimodal series rocks and characterized by volcano-tectonic depressions. Common characteristic of development of volcano-tectonic depressions is initiated by black density basalt, further generated phylitic dike, cupola and cover finally, finished by porosity basaltic flows. At present time, concavity reliefs with small salt lakes are stated on the center of these depressions. Volcanic rocks show high Ba, K and La and low Th, Nb, Ti and Y contents. SrI ranges from 0.705067 to 0.708303 and NdI ranges from 0.512462 to 0.512575.