

Large-scale intrusion in Tarim LIP: Evidence from geochemistry and geochronology of mafic complex in Wajilitag, XinJiang, China

DI FENG¹, LI SU^{1*}, LU XIONG¹

¹Institute of Earth Sciences, China University of
Geosciences, Beijing, Beijing, 100083, CHINA

(Di_Feng@cugb.edu.cn,

*correspondence:suli@cugb.edu.cn)

The Wajilitag mafic complex exposes in the Bachu Dome, XinJiang, China and covers about 40 square kilometers. The occurrence of the complex is nearly horizontal and the main part is fine-grained to coarse-grained layered gabbro interbedded with pyroxenite and olivine-gabbro. The upper part of the complex is vanadium titanomagnetite ore-deposits. These rocks consist of variable contents of Plagioclase ($Ab_{42.30-55.86}An_{42.53-54.99}Or_{2.72-1.31}$), clinopyroxene ($Wo_{44.58-49.22}En_{37.73-45.43}Fs_{9.27-14.73}$) and magnetite. All magnetite crystals have ilmenite exsolutions with high content of Ti (up to 50.51%).

The geochemical data indicate that all samples show LREE-enriched patterns. The $(^{87}Sr/^{86}Sr)_i$ ratios vary between 0.70407 and 0.70501, while $\epsilon Nd(t)$ values vary between -0.7 and 2.0. Geochemical and isotopic characteristics reveal that Wajilitag complex generated from the OIB-like mantle source and the crustal contamination had little influence on the magma composition. U-Pb analysis (LA-ICP-MS) of zircons from two groups of gabbro yields the concordant crystallization age of 286.8 ± 1.0 Ma and 287.0 ± 1.3 Ma which indicate the Wajilitag complex is related to the Permian magmatism in Tarim.

Wajilitag mafic complex is the product of crystallization and differentiation of mantle-derived high-titanium magma mixing with enriched components. This complex suggests a large-scale intrusion happened in the Permian magmatic event of Tarim LIP.