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EVOLUTION OF PICRITE MAGMATISM AND ORE FORMATION IN THE ULYTAU REGION OF CENTRAL KAZAKHSTAN

Abstract. The paper is dedicated to the petrology and metallogeny of mafic and ultramafic rocks of the Ulytau Range. Two hypabyssal rock complexes are established within the West Ulytau Belt, including the Karaturgai diabase-picrite complex in the north and the Beleuty ferrogabbro-norite and diabase-picrite complex. They are derivatives of melting of spinel peridotites, which makes them different from the suprasubduction zone ophiolitic complexes of Central Kazakhstan, which produced by melting of garnet peridotites. Igneous rocks of the Karaturgai complex are comparable with ultramafic and mafic rocks rich in augite and brown hornblende, which are produced by the normal course of volcanic differentiation, while igneous rocks of the Beleuty complex are more alkaline and they contain titanian augite and barkevikite. The former usually occur, when teschenites and essexites, as well as other alkaline gabbroids, appear in the diabase series. Copper–nickel sulfide ores with platinum group elements are linked genetically and geographically with picrite basalts and diabase-picrites of the Karaturgai complex and also with sulfide-bearing carbonatites enriched with heavy rare earth elements. It is likely that the origin of ferruginous quartzites of the Karasakpai ore field had relation to the hydrothermal processes occurred at the time when high-Fe subalkaline gabbro-diabases, probably of the Beleuty complex were intruded. The age of the intrusive rocks of the West Ulytau Belt is provisionally as Neoproterozoic, probably synchronous to the collisional processes resulted in the formation of the Rodinia supercontinent. A complex of Neoproterozoic peridotite-pyroxenite-gabbro-plagiogranite intrusive rocks is proven in East Ulytau. It was originated as a result of melting of different mantle sourness, unlike hypabyssal rock complexes of the West Ulytau Belt. Distinctive feature of the Ulytau complex is the presence of koswites which usually contain platinum group elements.

Key words: Ulytau, Kazakhstan, carbonatites, picrite basalts, diabases, ferruginous quartzites, copper–nickel sulfide ores, palladium, platinum, Neoproterozoic.