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THE THEORY OF FORECASTING AND EVALUATING THE MINERALS AND RAW MATERIALS BASE OF THE REPUBLIC OF KAZAKHSTAN

Abstract. The metallogenic researches over the past decades at the Institute of Geological Science named after K. I. Satpayev demonstrated the metallogenic analysis on the principles of new global tectonics is meant to be a reliable theoretical basis of forecasting and evaluating the minerals and raw materials base of the Republic of Kazakhstan. Each paleo-geodynamic situation corresponds to its own group of minerals on the territory of Kazakhstan. The small-scale pyrite occurrences of the Cypriot type (a basaltic layer of the oceanic crust) and iron and manganese occurrences (sedimentary layer) are associated with the formations of the ocean floor. The deposits of the banded iron formations are associated with the Precambrian sedimentary layer of the ocean crust. The pyrite-polymetallic, iron ore and gold mineralizations are in the ensialic island arcs, and pyrite copper zinc and gold mineralizations are in ensimatic arcs. The accretionary wedges of the volcanic belts and island arcs contain chrome occurrences and deposits, nickel-cobalt and gold mineralizations. Its magmatic belts are characterized by copper porphyric with molybdenum and gold and epithermal gold silver mineralization. A rare-metal, rare-earth and uranium mineralization is typical for the back-arc magmatic belts, and the coals, copper sandstones, manganese occurrences are for inter-arc (retro-arc) deflections. The large reserves of lead-zinc ores, phosphorites and vanadium shale rocks are contained in the passive margins formations. The large deposits of lead-zinc ores and iron and manganese are positioned in the continental rifts formations. The large gold reserves and copper-nickel mineralization (the simatic blocks), as well as rare metals and rare earths deposits are contained in the zones of collision. The large deposits of uranium, brown iron ore, bauxite, phosphorite, brown coals, titanium-zirconium placers, rare-earth and gold-bearing weathering crusts are associated with the Mesozoic-Cenozoic platform cover.

In the 70-80s of the last century, the papers are interpreting geological structure of a certain geographic areas of Kazakhstan [1] or any separate phases of its geological development [2] from the plate tectonics standpoint were originated in Kazakhstan. The 11-volumes monographic series of “Metallogeny of Kazakhstan. Ore Formations” was published in the Institute of Geological Sciences named after K.I. Satpayev in 1977-1983. A geotectonic confinement of the ore formations was contemplated there from the perspective of their geosynclinal-staged confinement, although in some regions the geotectonic environments were defined in terms of plate tectonics (the island arcs, rifts)

The map of a deep tectonic structure of Kazakhstan, the Mineragenetic map of Kazakhstan and the map of prediction of oil and gas potential of Kazakhstan made in 1: 2 500 000 scale have been produced in 2002. It was made by the group of geologists of the Institute of Geological Sciences named after K.I. Satpayev and the Geology Committee and Mineral Resources Protection of the Ministry of Energy and Mineral Resources of the Republic of Kazakhstan. A geodynamic base of which is completely based on the principles of a new global tectonics, and a three-volume monography “A deep structure and the mineral resources of Kazakhstan” [3], that represents by its content an expanded Explanatory letter to these maps. The same principle was retained at producing the 1: 1,000,000 scale Mineragenetic map of Kazakhstan published in 2007 and the Explanatory letter thereto [4]. In fact, this map represents a map of paleo-geodynamic conditions with a reflection of the mineragenetic burden is typical for each of them. A clear dependence of the metallogenic burden on the type of crust, the consistence of enclosing rocks are identified at the result of these actions and, consequently, generated the geodynamic environments made it