Petrography and petrology of listwaenites in the east of Khoosf

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Abstract: The studied area is situated in southwestern Birjand (South Khorasan). Lithologic units which are studied contains part of the late Cretaceous coloured melange, Cretaceous and Paleogen flysh sediments, Neogen conglomerate and Tertiary volcanic rocks. The listwaenite of this area often appears along fault zone, boundary of units, bedding planes and schistosity as yellow and brownish vein. The effect of CO\(_2\) bearing hydrothermal solutions on mentioned units, in suitable physico-chemical and thermodynamic conditions, caused Listwanitization reactions. Field and microscopic studies revealed that alteration process comprises pre-stage reactions (specially serpentine and talc forming reactions in ultrabasic rocks) and main reactions of listwanitization which in primary mineral paragenesis is changed to silisic - carbonate assemblages listwaenite). Abundance and type of minerals is depended on composition of primary rock, pH, Eh, T, \(P_{CO_2}\) and \(P_{H_2O}\). Microscopic studies and XRD analysis show presence of magnesite, breunerite, dolomite, calcite, smithsonite, quartz, clinochlore, talc, muscovite, chromite, pyrite and magnetite. Also SEM analysis and polished section studies represents Fe, Ni, Fe-Ni-Co sulphur that must be considered as pathfinder minerals for prospecting of Au, Ag, Hg,...

Keywords: listwaenite, Ultrabasic, Hydrothermal, Khoosf.