Introducing of base metals mineralization in the silica veins and porphyritic dikes in Gueen area, Kerman, Iran

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The Gueen area is situated in a part of the Urumieh-Dokhtar Magmatic belt of the centre of Iran. Geochemical anomalies checking in this area led to identifying of Au-S-Sb-Zn-Pb-Cu mineralisation. Base metals mineralization in silica veins and porphyritic dikes is the result of various granodioritic intrusive bodies. The ICP analyses of vein samples showed that the high enrichment of Au with base metals. The maximum grade of Au, Cu, Pb and Zn are 2.4, 3, 1.7 and 0.53 ppm, respectively. The Sb is a strong and useful path finder element for Au, particularly its distribution in upper levels mineralization. The maximum Sb grade is 63.1 ppm in the area. The mineralization is mostly observed in forms of vein and vein let around fault zones and dikes. Comparison between mineralization zone and distribution of rock units shows that the grandioritic intrusive bodies are metalotect of mineralization in this area. These intrusive bodies are injected to comagmatic intermediate volcanic units. The interjection of these acidic bodies has created various faults and fractures. Hydrothermal fluids flow in these faults and fractures has built various alterations. The most important of these alterations are argilic and silica that is mostly related to the location of these faults and fractures. The most important existing minerals are chalcopyrite, pyrite, bornit, chalcocite, malachite and galena that spread with silica and other alteration. The main mineralization texture is open space filling that is seen with vein texture, disseminated, overgrowing and replacement. The most mineralization is located in west of the area and decreases in east. The metal elements exist in various kinds of metal minerals and primary and secondary forms in different rocks. The existence of native and sulfide Pb can be a sign of the difference between mineralization systems of this element and can be the result of mineral fluids circulation.

Dissolution of minerals into Ultrahigh-Pressure (UHP) fluid and element mobilization during small-scale UHP fluid–rock interaction

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Fluids/melts released from subduction oceanic slabs are essential to generate mantle metasomatism and arc magmatism. Their generation and composition are the most poorly understood aspects of the subduction factory.

A zoisite-omphacite vein and its adjacent host UHP eclogite from the Dabieshan have been investigated in detail to study the geochemical behaviour of various elements during UHP fluid–rock interaction. The vein precipated from previous UHP fluid. The UHP fluid congruently dissolved quartz, kyanite and epidote, and incongruently dissolved omphacite and rutile in the nearby host eclogites, their proportion decrease gradually toward the vein.

Bulk rock analyses demonstrate that the host eclogites show systematic compositional changes toward the veins. Their SiO_2, Al_2O_3, TiO_2 and Na_2O decrease, and their MnO, MgO, CaO and FeO increase gradually. Mass balance calculations demonstrate that their trace elements show various degree of mass transfer which reflects their mobility during the formation and precipitation of the fluids released from the host UHP eclogites.