Geochemical study of alteration zones around Au-bearing silicic veins at Zailic, East of Ahar, East-Azarbaidjan Province

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Abstract: The Zailic gold-bearing veins are located in the Arasbaran metallogenic zone, east of Ahar, East-Azarbaidjan Province. The most important lithologic units in this area are andesitic and trachy-andesitic tuffs and lavas of Upper Eocene age hosting vein-type gold mineralization. Theses rocks have suffered silicic, argillic, phyllic, and propylitic alterations brought about by hydrothermal fluids. The geochemical study of alteration zones in this area showed that in the silicic zone, due to the acidic nature of altering fluids and hence intense leaching, depletion of most major and trace elements took place. The degree of leaching towards the propylitic zone, owing to the pH increase of the hydrothermal fluids, gradually decreases. The presence of minerals with high adsorption capacity, such as clay minerals, resulted in concentration and fixation of many elements in the argillic, phyllic, and propylitic zones. Consideration of the behavior of rare earth elements (REE) in silicic zone relative to almost fresh volcanic rocks showed that most of REE suffered depletion. Geochemical indices such as TiO₂ and (Ce + Y + La)-(Ba + S), showed that the hypogene hydrothermal fluids played an important role in the development of alteration zones at Zailic.

Keywords: Rare earth elements; phyllic; propylitic; argillic; silicic; alteration; Zailic; Ahar; East-Azarbaidjan.

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