

Using the geochemical behavior of silver element in the gap statistics method and multivariate analysis in Cu-Mo porphyry in Hararan area, Kerman province

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Abstract: One of the silver resources is Cu-Mo porphyry deposits, producing silver as by product. For this research, the results of analysis of 607 lithochemical samples for W, Zn, Ag, As, Ba, Co, Cu, Mo, Pb, Sb, Sn, Sr, Bi elements were used to investigate geochemical behavior of silver element in Hararan area which is located in the southeast of Iran and consists of copper mineralization seems to be connected to a porphyry Cu-Mo system. In this study, gap statistics and multivariate analysis techniques for identification anomalous areas of silver element and its associated elements were used. Anomalous areas maps achieved using gap statistics method showed that anomalous areas of Ag, Cu, Pb and zinc elements covered approximately each other. Dendrogram, which was earned from hierarchical cluster analysis, depict that Ag and Cu elements have associated with each other and formed one cluster. Although these elements are linked to Pb and Zn elements with lower correlation. As well, the results of factor analysis showed that the third factor include Cu and Ag elements with the highest eigenvalues. Consequently, geochemical bimodal behavior of Ag element i.e. accompaniment with Cu element by locating in Cu –bearing minerals such as chalcopyrite and bornite from one side and accompaniment with Pb and Zn elements by locating in mineral from other side was validated by using gap statistics and multivariate analysis techniques.

Keywords: *Silver element behavior; gap statistics; factor analysis; hierarchical cluster analysis.*

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