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Mapping Hydrothermal Alterations in the Muteh Gold Mining Area in Iran by using ASTER satellite Imagery data

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Muteh gold mining area is located in 160 km NW of Isfahan town. Gold mineralization is meso-thermal type and associated with silisic, seresitic and carbonate alterations as well as with hematite and goethite. Image processing and interpretation were applied on the ASTER satellite imagery data of about 400 km2 at the Muteh gold mining area to identify hydrothermal alterations and iron oxides associated with gold mineralization. After applying preprocessing methods such as radiometric and geometric corrections, image processing methods of Principal Components Analysis (PCA), Least Square Fit (Ls-Fit) and Spectral Angle Mapper (SAM) were applied on the ASTER data to identify hydrothermal alterations and iron oxides. In this research reference spectra of minerals such as chlorite, hematite, clay minerals and phengite identified from laboratory spectral analysis of collected samples were used to map the hydrothermal alterations. Finally, identified hydrothermal alteration and iron oxides were validated by visiting and sampling some of the mapped hydrothermal alterations.