IRANIAN SOCIETY of CRYSTALLOGRAPHY and MINERALOGY

Vol. 28, No. 2, Summer 1399/2020

IRANIAN JOURNAL of CRYSTALLOGRAPHY and MINERALOGY

Recognation and separation of high purity calcite mineral regions in carbonate units using Aster multispectral data and Sentinel 2 (case study northwest of Shahrekord)

A. Bozorgmehr*[1], E. Moradian[2], H.M. Reyahi Bakhtiari[1], A.R. Davoudian[2], M. Karimi[3], N. Shabanian[2]

1- Department of Forestry Sciences, Faculty of Natural Resources and Earth Sciences, Shahrekord, Iran
2- Department of Geology, Faculty of Natural Resources and Earth Sciences, Shahrekord, Iran
3-Department of Geology, Faculty of Sciences, University of Birjand, Iran

(Received: 5/7/2019, in revised form: 30/10/2019)

Abstract: Remote sensing has found a special technique and effective in the geological studies and mineral identification for the determination of minerals in the primary detection. The purpose of this study is to recognize the high purity calcite mineral regions in carbonate units using Aster and sentinel 2 images. Sampling of rocks and laboratory analysis using XRF and XRD for verification. The results showed that 97.22% the purity of calcite mineral ($CaCO_3$) is recognized in carbonate unit. The Sentinel 2 auxiliary data improved the spatial resolution of Aster visible and infrared shortwave bands to 10m. As well as CR, MF and SAM algorithms were calculated beside the calcite spectral index (CI) and RGB:831 image for calcite mineralization. By comparing the results of the algorithms, MF image had resembled to calcite spectral index image, so it was used in SAM method and calcite classification map was calculated. The results of comparing showed that calcite minerals categorized in the SAM method with the calcite index, 83.66% of calcite areas was correctly assigned to this mineral. Therefore, using spectral indexes and classification methods, minerals can be identified with the lowest cost and acceptable accuracy.

Keyword: *Aster images; detection; Cclcite mineral ($CaCO_3$); spectral angle mapper.*

*Corresponding author; Tel: 09134052461, Email: Atefeh.Bozorgmehr@yahoo.com

[Downloaded from ijcm.ir on 2024-05-04]

[DOR: 20.1001.1.17263689.1399.28.2.14.6]

[DOI: 10.29252/ijcm.28.2.461]