

عنوان مقاله:

Predicting slake durability of carbonate rocks using geomechanical properties (Case study: Durood-Khorramabad highway, Iran)

محل انتشار:

مجله بین المللی معدن و مهندسی زمین, دوره 55, شماره 1 (سال: 1400)

تعداد صفحات اصل مقاله: 5

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خلاصه مقاله:

This study investigates the relationship between slake durability indices and geomechanical characteristics of five types of carbonate rocks situated in the west of Iran along the Doruod-Khorramabad highway. In this study, five types of limestone rocks were selected, including grey limestone (A), marly limestone (B, C, D), and sandy limestone (E). The geomechanical characteristics of the studied limestones were calculated based on the ISRM (۱۹۸۱) standard stimulations. Statistical approaches were executed to find the most influential geomechanical characteristics on slake durability indices and to find an appropriate slake durability cycle for interpreting rock behaviors. According to the simple regression analysis, the first and fourth cycles of slake durability can provide adequately good information for initial engineering/design works. Also, the correlation coefficients demonstrated nearly constant change after the fourth cycle. Geomechanical parameters, like Schmidt hammer and dry density, showed the highest correlation with the fourth slake durability cycle ($R = 0.98$). On the other hand, uniaxial compressive strength revealed a poor correlation ($R = 0.49$) with this cycle. Apart from estimating the n th durability cycle from geomechanical properties, it is possible to calculate the second to fourth cycles of slake durability using the results of the first durability cycle ($R = 0.99-0.94$). Consequently, a multivariate equation was developed based on water absorption, Schmidt hammer, effective porosity, and modulus of elasticity with $R^2=0.89$ using the best subset regression method.

کلمات کلیدی:

Slake durability, geomechanical characteristics, Carbonate rocks, Simple and multiple regressions

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