

## **The Effect of Depth on the Cation Exchange Capacity of Clay along a 5 m Deep Sediment Bank in the Lake Van Basin<sup>#</sup>**

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**Abstract:** Assessment of the variability of cation exchange capacity (CEC) of clays with depth is an important issue concerning several areas, including the study of change in clay mineralogy under burial conditions, geological characterization, agricultural assessment, clay mineral exploration, and mine planning. In this study, the CEC of claystones is measured along a 5m high wall of an open-pit mine with a focus to investigate its relationship with depth. The methylene blue testing method is used for these measurements. The results show CEC values varying from 17 meq/100g to 36 meq/100g, with a general trend showing an increase as the depth of cover increases. A straight regression line can be fitted to the results with the regression coefficient of 0.73. The results are also consistent with the study area's chlorite-illite mineralogy that is expected to yield CEC values in the range of 10-40 meq/100 g. A test sample from a commercial bentonite site yielded 80 meq/100g--a result expected from bentonitic clays that confirms the validity of the methodology. Identification of this type of relationship is important in many areas, including understanding of changes in clay mineralogy under burial conditions, mine planning, agricultural assessment, and environmental evaluations.

**Keywords:** *Clay, cation exchange capacity, methylene blue test, mining, Lake Van*

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