

Evaluation and comparison of CEC in various bentonites by three different analytical methods

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Determination of Cation Exchange Capacity (CEC) in various bentonites available at home and abroad was carried out by three different analytical methods. Bentonite is an important source of montmorillonite which is a 2:1 sheet-layered smectite clay mineral with platy structure in which ionic substitution takes place, therefore, in order to neutralize their surface charge, interlayer cations can be located between the layers, and other cations can be absorbed reversibly [1] [2]. One of them is a BaCl₂/MgSO₄ method which is further substitution of Mg subsequent to Ba, followed by titration using EDTA under addition of ammonia buffer [3]. Another is an ammonia electrode method for ammoniated bentonites [4]. The other is a equilibrium pH method in which total exchangeable metallic cations of bentonite are replaced with acetic acid [5].

Comparison of CEC values in various bentonites determined by three different analytical methods is shown in Fig. 1. The pH method was the most simplest but the CEC values were higher than those obtained by the ammonia electrode method in the case of bentonites containing calcites.

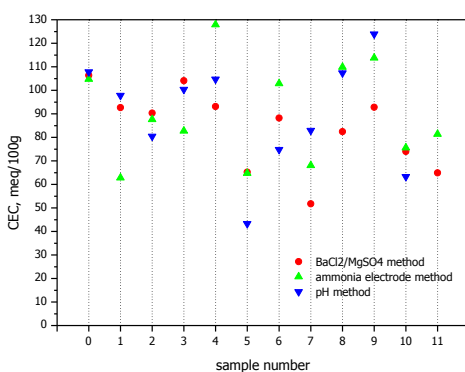


Figure 1: Comparison of CEC values in various bentonites determined by three different analytical methods

[1] Uddin (2008) *Metall. Mater. Trans. A* **39A**, 2804-2814. [2] Dohrmann & Kaufhold (2009) *Clays clay Miner.* **57**, 338-352 [3] Inglethorpe *et al.* (1993) *Bentonite* [4] Borden & Giese (2001) *Clays clay Miner.* **49**, 444-445 [5] Jackson (1958) *Soil Chemical Analysis*