

## Surface Characteristics of *Bacillus megaterium* and Its Adsorption Behavior onto Dolomite

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**Abstract :** Surface characteristics of *Bacillus megaterium* strain were investigated; zeta potential, FTIR and contact angle were measured. Surface energy components including Lifshitz-van der Waals, Hamaker constant, and acid/base components (Lewis acid/Lewis base) were calculated from the contact angle data. The results showed that the microbial cells were negatively charged over all pH regions with high values at alkaline region. A hydrophilic nature for the strain was confirmed by contact angle and free energy of adhesion between microbial cells. Adsorption affinity of the strain toward dolomite was studied at different pH values. The results showed that the cells had a high affinity to dolomite at acid pH comparing to neutral and alkaline pH. Extended DLVO theory was applied to calculate interaction energy between *B. megaterium* cells and dolomite particles. The adsorption results were in agreement with the results of Extended DLVO approach. Surface changes occurred on dolomite surface after the bio-treatment were monitored; contact angle decreased from 69° to 38°; and the mineral's floatability decreased from 95% to 25% after the treatment.

**Keywords :** *Bacillus megaterium*, surface modification, flotation, dolomite, adhesion energy

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