

**Specific surface area measurement after organic matter removal
and its implication for the calculation of weathering rates
for critical loads of terrestrial**

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Mineralogy and the exposed surface area are most important factors for calculating the weathering rates of soils. But there has not been known an accurate method for calculating the weathering rate, because soils are mixtures of inorganic and organic materials of various size distributions and structures. Surface area of minerals plays an important role in most of programs for calculating the weathering rates or critical loads. The BET measurement is recommended for the measurement of specific surface area in most of programs. But the BET values measured without organic matter removal are in fact those for all the N₂-adsorbed surface areas, including the surfaces covered and aggregated with organisms. Surface areas occupied by organisms are assumed to be more reactive to weathering by organic activities. Therefore, the BET surface area difference before and after organic removal depicts the area occupied by organisms. The present study shows that the BET values after organic matter removal using H₂O₂ are larger than those without removal by 1.39 – 6.32m²/g. This means that the BET measurement without organic removal excludes the reactive area occupied by organisms and that the area occupied by organisms in soils is much larger than expected. Therefore, specific surface area measurement for calculating the weathering rates of minerals in soils should be made for both samples before and after organic matter removal.