

A new method of determining the cation exchange capacity (CEC) of clay minerals was examined.¹ This method involved exchanging the smectite clay with organic cations and using bomb calorimetry to measure the energy of combustion of the material. Because the clay is noncombustible, the energy is completely dependent on the amount of organic present, which is dependent on the CEC of the clay. Two organic cations, tetrapentylammonium and octadecyltrimethylammonium, with similar size but much different shape were used. For clays with lower CECs, using the more symmetric ion yielded better accuracy (4.24%), while for clays with higher CEC, using the straight chain organic yielded better accuracy (1.16%). Overall, the results indicate that using bomb calorimetry presents a viable option in the determination of cation exchange capacity.