

5. heat solution to boiling on the hot plate, stirring continuously and titrate with methylene blue solution until end-point is reached - this occurs when the halo of pale turquoise around a blue dye spot on filter paper occurs;
6. calculate the shale factor:

$$\text{Shale Factor (meq/100gm)} = \frac{100}{\text{sample wt, gm}} \times \text{volume} \times \text{normality of methylene blue solution}$$

Where volume = volume of methylene blue used when end-point was reached, ml

7. If clay is calcareous, and calcimetries are also being run, shale factor may be corrected for carbonate content (assuming clay matrix is of same density as the carbonate matrix).

$$\text{True shale factor} = \frac{100}{100 - \text{CaCO}_3\%} \times \text{apparent shale factor}$$

Note that the shale factor as measured at the wellsite will not give values corresponding to actual chemical cation exchange capacity. This is due to impurities in the sample, variations in methodology, experimental errors, and the fact that the methylene blue dye (used in the titration) is a very large molecule and thus cannot be adsorbed in interlayer sites.

(c) Cuttings Physical Character

Cuttings over shale shaker are continuously monitored for any indication of geopressure. Cuttings for normally pressured shales are generally small, semi-flat and rounded edges, while cuttings from a geopressure zone drilled underbalanced are typically larger, angular edges, flat, splintery, and often as jagged and elongated concave, curved samples. The quantity of cuttings often increases while drilling underbalanced