

## METHYLENE BLUE TEST

### Supplies

1. Erlenmeyer Flask
2. Hot plate
3. Stir Rod
4. Hydrogen Peroxide
5. Sulfuric Acid 5N
6. Methylene Blue: (solution strength - 0.01 meg)
7. 10 mL pipette
8. Syringe 2cc Glass
9. 50 mL graduate cylinder
10. Bulb pipette safety or pipette pump
11. Water

Clay CEC	(milliequiv./100gm)
Drilled Cuttings	8 to 12
Kaolinite	10
Soft Shale	45
Moisture Free Wyoming Bentonite	75

### TEST PROCEDURE

1. Add 10-15mL fresh water into the Erlenmeyer flask then measure 2mL of mud using the syringe
2. Add 15 mL Hydrogen Peroxide and 12 drops 5N Sulfuric Acid then mix by swirling or stirring
3. Gently boil for approximately 10 minutes and dilute with 20 mL fresh water.
4. Add Methylene Blue in 1 mL at a time, after each addition swirl the flask or stir vigorously for at least 20 seconds then remove a drop of sample on the end of the stirring rod.
5. Apply the drop to a piece of filter paper. The approximate end point is reached when a blue “halo” spreads out from the blue spot on the filter paper. If no “halo” appears repeat step 4 until the halo appears. At this point, without adding any more Methylene Blue swirl the flask for two minutes and place another drop on the filter paper. If the blue halo is still present the end point has been reached. If the halo does not appear continue with the Methylene Blue increments until a blue ring permanently forms after two additional minutes of swirling. (0.5 mL increments of Methylene Blue can be used for greater accuracy)

### CALCULATIONS

$kg/m^3 \text{ reactive clay} = 14.25 \times mL \text{ methylene blue}/2$

(Simplified equation:  $kg/m^3 \text{ reactive clay} = 7.125 \times mL \text{ Methylene Blue}$ )

The methylene blue dye and hydrogen peroxide should be stored in a cool, dark place to extend their life. These solutions should be replaced every four months.

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