FIELD TEST METHOD FOR TOTAL TITRATABLE ALKALI IN POTASSIUM SILICATE DRILLING FLUID

The total titratable alkali will be used to calculate K_20 and monitor the ratio of SiO_2:K_2O

A potassium silicate drilling fluid filtrate sample is weighed into a flask and mixed with water in a small amount of indicator (Methyl Red). The solution is then titrated with 0.2N HCl acid. All materials that react with the acid are titrated and are calculated as a percent potassium oxide (K_2O).

Supplies

1. Hydrochloric Acid (HCl) 0.2N
2. Methyl Red Indicator
3. Breaker - 400mL
4. Calibrated Pipette – 10 or 25mL
5. Graduated Cylinder -50 or 100ml

TEST PROCEDURE

1. Measure 5mL (to the nearest 0.1mL) of potassium silicate drilling fluid filtrate into a beaker.
2. Add 100mL of distilled water and swirl beaker until completely mixed.
3. Add 4 drops Methyl Red Indicator and swirl beaker, solution will turn yellow.
4. Titrate sample with 0.2N HCl acid till a red color develops.
5. Record volume of HCl acid used

Note: Samples should be done in duplicate to ensure accuracy. Results may be effected by other mud products such as Caustic, sodium silicate, sodium carbonate and/or possible contamination from drilled solids.

Calculations

(V x 0.94)/W=%K2O

V= volume in mL of HCl used during titration **W**= weight in grams of silicate drilling fluid sample

FIELD TEST METHOD FOR SILICA CONTENT (SiO_2 Percentage) IN POTASSIUM SILICATE DRILLING FLUID

The SiO_2 will be used to calculate total silica and to monitor the ratio of SiO_2:K_2O

A silicate drilling fluid filtrate sample is weighed into a flask and mixed with water in a small amount of Methyl Red Indicator. The solution is titrated with 2.0N HCl acid until it turns and stays a reddish-orange.

SUPPLIES

1. Hydrochloric Acid (HCl) 2.0N
2. Methyl Red Indicator
3. Breaker - 400mL
4. Calibrated Pipette – 10 or 25mL
5. Graduated Cylinder – 50 or 100mL
6. Sodium Fluoride (4g per test)

TEST PROCEDURE

1. Measure 5mL (to the nearest 0.1mL) of potassium silicate drilling fluid filtrate into the beaker.
2. Add 100mL of distilled water and swirl beaker until completely mixed.
3. Add 4 drops of Methyl Red Indicator and swirl beaker, solution will turn yellow.
4. Titrate sample with 2.0N HCl acid until a red color develops and stays while stirring.
5. Add 4g of previously weighed Sodium Fluoride and mix. The color will turn back to yellow.
6. Continue titration after the addition of Sodium Fluoride and titrate until the yellow color disappears and a reddish-orange color develops and stays.

CALCULATIONS

$(\%K_2O \times W)/9.42$=alkali correction (AC) $((V-AC)\times 3.0)/W=\%SiO_2$

$\%K_20$ = Previously calculated from alkali titration in part 1

V= volume in mL of HCl used during titration W= weight in grams of silicate drilling fluid sample