

# PHPA Adapter (HPK Test) Instruction Sheet

#### WATER BASED FLUID TEST PROCEDURE

- 1) Pre-heat HTHP jacket to 285 °F
- 2) Dry HTHP Cell; Insert and tighten stem valve; Invert and place in stand
- 3) Add amount of sample (typically 5 mL)
- 4) Add DI water (55 mL)
- 5) Add 5 mL NaOH (5N); Put lid on and lock in place with set screws
- 6) In PA apparatus add 30 mL Boric Acid (3% aq. soln.) and 6 drops bromocresol green- methyl red indicator (should be a pink color)
- 7) Place HTHP cell in heating jacket, keeping the cell inverted
- 8) Place PA apparatus on cell, and lock in place with pin
- 9) Carefully open stem-valve one-quarter turn so that pressure can be released from cell.
- 10) After first bubble appears in HPK boric acid solution, start a 30 min. timer.
- 11) After 30 min. close stem-valve and lift cell out of the jacket.
- 12) Carry out titration in titration bowl using  $N/50~H_2SO_4$  (solution should turn from dark green to red/pink color)
- 13) Calculate ppb PA from calibration curve.
- 14) Clean-up is simply done by washing cell and PA apparatus with tap water.

# Notes:

- 1) Calibration should be carried out with samples containing the equivalent of 1 ppb, 2 ppb, 4 ppb, 8 ppb PA. Individual calibration curves should be determined for different additives (e.g., PHPA, CLAY GRABBER, CLAY SYNC etc...)
- 2) If more than 30 mL of acid is required, test should be redone with 2.5 mL of sample, and 57.5 mL of DI water.

#### ORGANIC/SYNTHETIC BASED FLUID TEST PROCEDURE

## **Modified SOP for LE SUPERMUL Test**

- 1) Dry HTHP Cell; Insert and tighten stem valve; Invert and place in stand
- 2) Add a measured amount of mud sample (typically 5 mL)
- 3) Add DI water (50 mL)
- 4) Add 5 mL NaOH (5N); Put lid on and lock in place with set screws
- 5) Also, place cell stem in lid.
- 6) Place collection apparatus (HPK unit) on cell stem, and lock in place with pin.
- 7) In collection apparatus bowl add 30 mL Boric Acid (2% aq. soln.) and 7 10 drops bromocresol green- methyl red indicator (should be a *faint pink* color)
- 8) Place HTHP cell/with attached collection apparatus into the pre-heated\* heating jacket, keeping the cell inverted. *Open the stem-valve* connecting HPK and HPHT cell one-quarter turn.
- 9) After first bubble appears in boric acid solution, start a 60 minute timer.
- 10) After color change\*\* (*faint green*), *close stem-valve*, lift cell/with collection apparatus out of the jacket, and place in cell holder.
- 11) Carry out the titration in the collection apparatus bowl using  $N/50 H_2SO_4$  (solution should turn from *faint green* to *faint pink* color). The solution can be optionally transferred to a 50 100 mL beaker, a small magnetic stirring bar added, and the solution titrated while mixing on a magnetic stirrer.
- 12) To calculate lb/bbl LE SUPERMUL:

#### a.) mL LE SUPERMUL/ mL mud

Divide the mL of Acid used, by the standard coefficient (1); then divide this value by the mL of mud used. [(mL Acid/SC)/mL Mud]

## b.) g LE SUPERMUL/mL mud

Multiply the value in step (a) by the density of LE SUPERMUL (0.924 g/mL)

## c.) lb/bbl of LE SUPERMUL

Multiply the value in step (b) by 350 mL (~ 1 bbl)

13) Clean-up is simply done by washing cell and collection apparatus bowl with tap water.

\*The Heating Jacket should be preheated to 300°F

\*\*The color change timing may vary from 30 to 60 minutes, depending on the LES concentration.

#### **Notes:**

- 1. The standard coefficient (*SC*) should be determined by performing the test on weighed amounts of LE SUPERMUL i.e. 0.5g, 1.0g, 1.5g
- 2. If more than 30 mL of acid is required, test should be redone with 2.5 mL of sample.

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