

High Performance Kjeldahl Titration Apparatus

A safer, faster, more cost efficient method for analyzing Polyacrylamides has been developed. The apparatus is more robust than current test kits and is suitable for field use. In addition, the analysis can be successfully utilized with whole muds, filtrates, or standard polymer solutions. The test has produced results that are drastically more reproducible (± 0.25 ppb on a given sample) than the current test employed, while obtaining the same results accuracy. This particular test is not limited to Polyacrylamides; compatibility studies are being conducted with other drilling fluid additives.



Top view



Upside down view with stem-valve

MORE EFFICIENT POLYMER FIELD TESTING

The current technique used in the field for PA/PHPA testing is centered on a caustic digestion of the whole drilling fluid, followed by collection of ammonia in a boric acid solution, and back titration with sulfuric acid to determine the PA content. In order to undertake this chemistry a fluids engineer uses a set-up consisting of glass flasks, condensers, and rubber hoses. While the chemistry behind this test is safe, there are many problems with the current test kit. Potential problems with this particular set-up are (a) loose/cracked hoses that release ammonia in the vicinity of workers, (b) fragile glassware which is easily broken on a rig site, (c) the time taken carrying out the test, and (d) consistency in results accuracy because of super-heating, “bumping” of the basic digestion solution.

The Fann HPK Titration Apparatus overcomes many of the inherent PA-test problems by combining all the reaction vessels currently used into a single piece that is made of steel/PVC and connected by gas-tight stem valves. This apparatus provides both improved consistency in results and greater accuracy with the new procedure.



HPHT Filter Press and HPK Apparatus

Equipment Required

HPK Titration Apparatus Part No. 371240

Sodium Hydroxide 5N, NaOH

Sulfuric Acid N/50, H₂SO₄

Deionized Water

HTHP Filter Press

Bromocresol Green-Methyl Red Indicator

Boric Acid 3% Solution

Procedure

An HTHP jacket is pre-heated to 285 °F. A stem valve is inserted and closed on a dry HTHP cell. This cell is inverted and placed in a stand. Whole mud is then added, along with Deionized Water, and Sodium Hydroxide (NaOH). The lid is placed on the cell, and locked into place. The HPK apparatus valve-stem is then screwed into place on the HTHP cell. Boric acid and 6-10 drops of bromocresol green-methyl red indicator are added to the bowl of the titration apparatus. The apparatus is then locked onto the valve-stem with the Cox safety pin. The whole apparatus is placed into the pre-heated jacket and a 30 minute timer is started upon the appearance of the first bubble. After 30 minutes the safety pin is removed, the bowl placed aside on its base. Titration of the boric acid solution can then be carried out using N/50 Sulfuric Acid (H₂SO₄) – the solution should turn from a dark green back to a pink color. The ppb of active material can then be calculated from a calibration curve previously determined with standard solutions.



Ordering Information

Order Part No. 371240 – HPK Titration Apparatus

HPHT Filter Press and reagent chemicals sold separately

**All items required to complete the HPK Test are available from
Fann Instrument Company**

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Houston, Texas USA 77210

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