



Simple Precision™

SAMPLE DILUTION METHOD FOR THE KAM KF KARL FISCHER MOISTURE ANALYZER

Viscous crudes may cause difficulty with sample extraction. In cases where the viscosity of the sample is such that it cannot be pulled into a syringe, users may dilute the sample prior to determination. KAM also recommends users to apply this method when the anticipated water content of the sample is over 5% water.

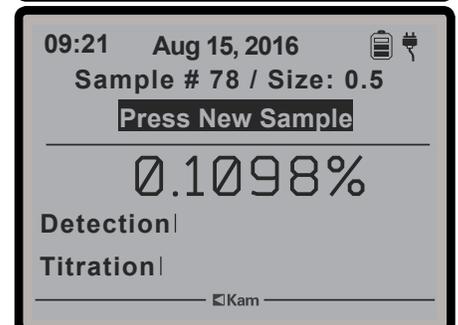
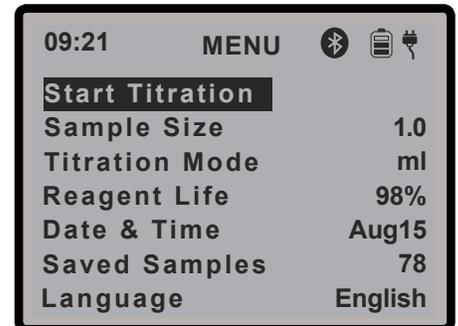
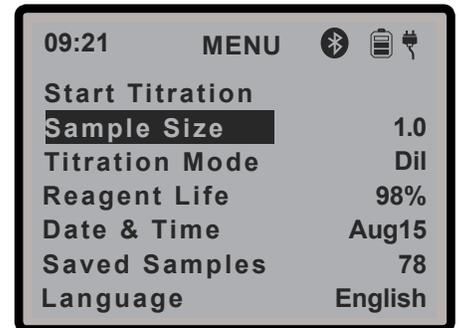
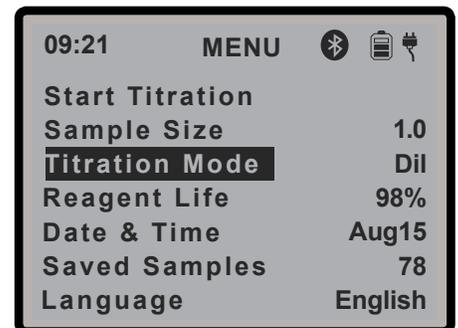
PLEASE NOTE: The specific sample/syringe volume options for dilution mode are either 0.5 or 1.0 ml. (Other sample sizes are visible but should not be used). To determine the appropriate size, divide the anticipated/observed water content by 100 then refer to API chapter 10.9 for the appropriate sample/syringe volume. Due to the increased error associated with sample dilution, .5 ml should be the minimum sample volume used.

1. Pour 100 ml of reagent-grade xylene or another suitable diluent into a certified volumetric flask or graduated cylinder. Any of the following may be used as suitable diluent for crude oil: kerosene, Stoddard solvent, and toluene (API MPMS Chapter 10.9 compliant).
2. Draw and discard 1 ml of said diluent with a syringe so that there is 99 ml left.
3. Seal the volumetric flask or graduated cylinder with its stopper.
4. Prepare the sample to be analyzed. If it is stored in a bottle with a lid, first shake it well by hand.
5. Mix the sample with a homogenizer for 5 minutes. Increase the speed toward the end to ensure that it is well mixed. Take care that the sample does not increase in temperature more than 10° C per API 10.9.
6. While mixing with the homogenizer, use a 1 ml syringe to draw a sample. Fill the syringe until fluid exceeds the 1 ml mark, and empty the syringe in a appropriate, separate container for disposal. Do this three times.
7. Draw a fourth sample slightly larger than the 1 ml mark on the syringe. Using a paper towel, hold the unit vertically by the needle end. Tap the syringe body to allow any air bubbles to rise the top, then press plunger until the sample exactly matches the 1 ml line on the syringe. Excess sample fluid should be expunged into the paper towel.
8. Slowly inject the sample into the volumetric flask with 99 ml of diluent. If using a graduated cylinder, pour the 99 ml of diluent into a beaker with stir bar and then inject the 1 ml sample.
9. Carefully insert a small stir bar into the flask/beaker, avoiding any spills.

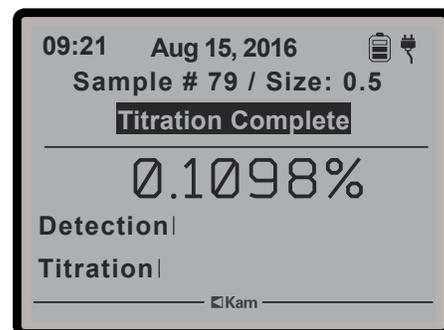
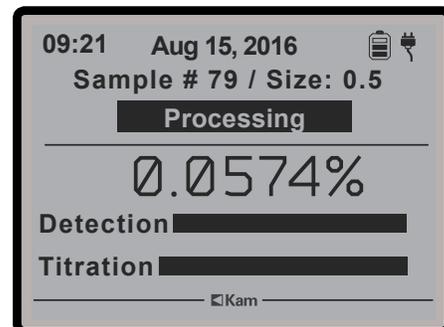
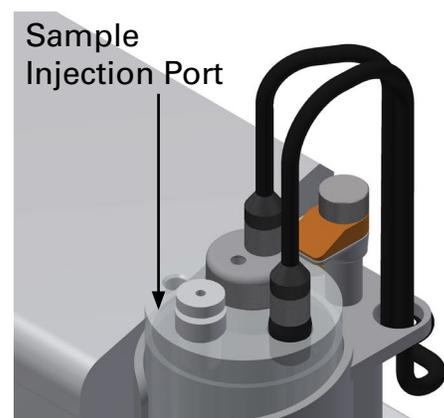
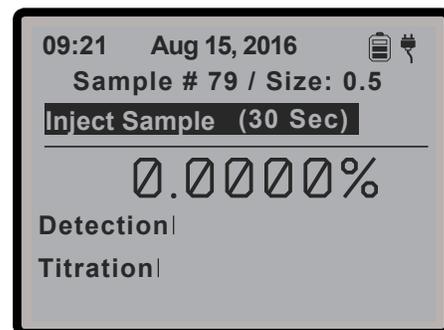
10. Place the flask/beaker with sample on a magnetic stirrer.
11. While mixing, withdraw and discard three portions once again. The fourth sample will be injected into the KAM KF unit.

DILUTION MODE OPERATION

1. From the Main Menu on the KAM KF unit, scroll down to Titration Mode and use RIGHT/LEFT arrows to switch to Dilution Mode indicated by "Dil".
2. Navigate to Sample Size and use the RIGHT/LEFT arrows to select the volume matching that of the syringe (.5 ml or 1 ml). The analyzer automatically adjusts for the dilution factor based on the sample size.
3. Scroll up to Start Titration and press ENTER.
4. The stir bar will begin to spin and the display will show "Removing Excess Water". This may take several minutes if the instrument has been out of the titration mode for a long period of time. If reagents have just been replaced, wait a minimum of two hours prior to starting titration.
5. When all excess water has been removed, the unit will beep and the display will alternate between "Analysis Complete" and "Press New Sample."
6. Press the NEW SAMPLE key the keypad.



7. The display will read "Inject Sample" and a thirty-second countdown will begin. Insert syringe needle through the Sample Injection Port, piercing the Septum and continuing into the cell until the needle tip is fully submerged in the Reagent.
8. Inject the diluted sample into the Reagent. This should be done in a single, swift movement, but do not allow the sample to splash up against the wall of the Generator Solution Cell or the needle to touch the sides of the cell.
9. Electrolysis begins automatically by the injection of the sample. When the analysis is completed, the unit beeps and the results will be displayed on the Titration Complete screen.



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