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Aniline Point Determination Kit

No. 145-80 - 115 Volt

No. 145-80-1 - 230 Volt

Instruction Manual

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Ver. 1.3

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Intro

The OFITE Aniline Point Determination Kit determines the aniline point of oil used in drilling fluid. The aniline point indicates whether damage may occur to elastomeric (rubber) parts of a drilling rig when oil is added to the drilling fluid. In general oils with a high aromatic content are more detrimental to rubber products than those with a low aromatic content. The relative aromatic content of an oil is indicated by its aniline point and oils with a high aromatic content have a low aniline point and vice versa.

The higher the aniline point of the oil, the more desirable it is for drilling fluid usage. By definition, the Aniline Point is the lowest temperature at which equal volumes of Aniline and oil are completely miscible (clear). The aniline point of an oil should be 150°F or above to minimize damage to elastomer parts, but this may indicate oils of less solvency and lowered ability to disperse asphaltic materials in oil muds.

This method is suitable for transparent liquid samples having an initial boiling point above room temperature and where the Aniline point is below the bubble point and above the solidification point of the Aniline sample mixture. The procedure is useful in characterizing pure hydrocarbons. For example, aromatic hydrocarbons exhibit the lowest Aniline points and paraffinic hydrocarbons exhibit the highest values. Cycloparaffins and olefins exhibit values that lie between those of paraffins and aromatics. In a homologous series, the Aniline Point increases with increasing molecular weight. The Aniline Point for mixtures of hydrocarbons such as diesel oils and mineral oils serves as a guideline for judging the aromatic hydrocarbon content of an oil and for comparing oils.

Components:

#130-78-25	Heater Bath Oil, 16 fl oz
#145-83	Utility Clamp, Fiberglass Jaws
#152-48	Hot Plate - Stirrer, 115 Volts - or -
#152-49	Hot Plate - Stirrer, 230 Volts
#152-48-1	Support Rod for Stirrer, ½"
#153-15-1	Test Tube, Glass, 20 × 1.2 × 150 mm
#153-15-2	Test Tube, Glass, 41 × 2.0 × 150 mm
#153-29-2	Syringe, Glass Tip, 10 cc
#153-40	Pipette, Glass, 10 mL × ¼ mL
#153-41	Pipette Aid, Safety Bulb
#153-51-3	Beaker, Glass, 50 mL
#153-53-11	Stirring Bar, Magnetic, ½" × ⅝"
#153-88	Cork for Thermometer, Size 8
#153-89	Cork for Test Tube, Size 20
#154-26	Thermometer, 77 to 221°F
#165-62	Syringe Filter, Puradisc, PTFE

Reagents:

#145-84	*Aniline Solution, 8 oz (UN1547) (Aniline is an Extremely Hazardous Reagent)
#285-06	Calcium Sulfate, Anhydrous, 2 oz

Optional (Not Included):

#166-03	Portable Balance, 0 to 320 × 0.1 gram Carrying Case
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Parts



Important

Safety



Aniline is highly **POISONOUS** and extremely **HAZARDOUS**. Refer to Material Safety Data Sheet (MSDS) before use. Avoid contact with skin and clothing and avoid breathing the vapor. Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene and nitrile rubber are recommended. Use chemical safety goggles and/or a full face shield where splashing is possible.

First Aid

In all cases, GET MEDICAL ATTENTION IMMEDIATELY.

If Inhaled - Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do not give mouth to mouth resuscitation.

If Skin Contact - Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse.

If Taken Internally - Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

If Eye Contact - Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally.

Procedure

1. Withdraw 15 mL of oil sample using a clean, dry 10 mL glass syringe. Inject 15 mL of oil sample into a 50 mL glass beaker. Insert magnetic stir bar and place onto the magnetic stirrer. Turn on magnetic stirrer and allow a vortex to be formed. Clean and dry glass syringe after use.
2. Dry the oil sample by adding approximately 10% by volume Calcium Sulfate as a drying agent in the oil sample. Allow the oil sample to stir for 5 minutes.
3. Screw in the support rod on the back of the heated magnetic stirrer and attach utility clamp. Add heating bath oil into the jacket tube until it's approximately half full. Place the jacket tube into the utility clamp and lower both until the bottom of the jacket tube comes in contact with the top of the heated magnetic stirrer.
4. Use the 10 mL glass syringe and withdraw 10 mL of oil sample. Attach a PTFE membrane filter onto the Luer Lok fitting of the 10 mL glass syringe.
5. Insert the magnetic stir bar and inject 10 mL of filtered oil sample into the test tube.

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6. Using a rapid release pipetting device, or suction bulb and glass pipette, withdraw 10 mL of Aniline and inject it into the test tube. Place the cork with small hole bored out onto the test tube. Do not use a rubber stopper.
7. Insert the thermometer through the hole in the stopper, making sure the thermometer does not touch the sides or the bottom of the test tube.
8. While at room temperature, turn on magnetic stirrer and allow the magnetic stir bar to stir the mixture rapidly. Avoid forming air bubbles. Observe if the mixture is miscible (clear) or immiscible (cloudy). If it is clear, at ambient temperature, the mixture must be cooled in a cooling bath. Allow the mixture to cool slowly while stirring rapidly and determine the Aniline point as described below in step 10.

For most base oils the Aniline-oil mixture will be immiscible (cloudy) at room temperature.

9. If the mixture at ambient temperature is cloudy, heat the mixture slowly to increase the temperature of the mixture in the test tube at a rate of 2 to 5°F per minute (1 to 3°C/min.). Stir the mixture until both liquids completely mix and become clear. Remove the mixture from the heating source.

Water should not be used as a heating or cooling medium because Aniline is hygroscopic. Moist Aniline will cause erroneously high results.

Do not heat an Aniline-oil mixture beyond 200°F (93°C). To do so could be unsafe.

10. Continue stirring the mixture as it cools at a rate of 1 to 1.8°F per minute (0.5 to 1.0°C/min).

Monitor the mixture as it cools and notice when the cloudiness first reappears. Record as the "Aniline Point" the temperature at which the mixture becomes cloudy throughout. The true Aniline Point is characterized by a turbidity that is so cloudy that it obscures the thermometer bulb in reflected light.

11. Continue cooling the mixture while stirring to a temperature of 2.0 to 3.5°F (1 to 2°C) below the first appearance of cloudiness.
12. Heat the mixture again until it again becomes clear. Remove the heat and cool until the cloudiness returns to obtain another observation of the Aniline Point Temperature.
13. Repeat the observations of the Aniline Point several times until a value is determined to within 1°F (0.5°C).



Note



Note



Important