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PLANT METHODS FOR CONTROLLING THE PRODUCTION OF CRUDE AROCLORS

SPECIFIC GRAVITY

The temperatures at which the gravities of liquid Aroclors are taken vary with the viscosity of the liquid.

A metal cylinder of suitable size is provided for catching the sample from the chlorinator. The sample, after being caught, is cooled under the tap to within about 10°C of the temperature at which the gravity is to be taken. The hydrometer is then immersed in the liquid to a depth just sufficient to cover the bulb and is held in this position with the left hand while the liquid is stirred vigorously with the thermometer in the right hand. This stirring is continual until the temperature of the liquid is one degree above the desired gravity temperature. At this point the thermometer is quickly removed and the hydrometer allowed to sink gently as far as it will into the center of the cylinder of liquid. The hydrometer is read and this reading recorded as the gravity of the aroclor.

The gravities of Aroclors 1119, 1142, 1148, 1150, and 1154 are taken at 65°C.

The gravities of Aroclors 1160 and 1162 are taken at 90°C.

The following table shows the limits within which each aroclor should be finished.

1119	-	1.112 - 1.117
1142	-	1.345 - 1.350
1150	-	1.423 - 1.428
1154	-	1.503 - 1.507
1160	-	1.563 - 1.567
1162	-	No hydrometer (Must be finished by Westphal)

NOTES

Be sure the sample is stirred well but carefully in order to avoid breakage.

The hydrometer s hould be read as quickly as possible, since the temperature drops would give a wrong reading.

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ACIDITY

Approximately 35 cc of the liquid aroclor (or 50 grams of a solid aroclor) is poured into a 250 cc beaker. To this 100 cc of alcohol-benzol mixture (furnished by the laboratory) is added. The mixture is titrated with N/10 caustic solution (also obtained rrom the laboratory). Before the titration is started a little water is added from the tap. When the end point is reached the water layer will be colored pink. The blowing operation is complete when less than 8 cc of the caustic solution are required to reach the end point.

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SOFTENING POINT OF SOLID AROCLORS
Ball and Ring Method.

Preparation of the Sample

The sample shall be melted and stirred thoroughly, avoiding overheating or incorporating air bubbles in the mass and then poured into the ring so as to leave a slight excess on cooling. Since the Aroclors shrink considerably on cooling, the ring should be well filled, nearly to overflowing. A little of the excess should be drawn over the top of the ring at several points so as to prevent the cooled Aroclor from dropping out of the ring. In the same way, the second ring is filled with a standard Aroclor of known softening point. The standard Aroclor should have a softening within at least 10 to 15° of the Aroclor being tested.

The rings while being filled should rest on a clean can lid or on a brass plate which has been amalgamated to prevent the Aroclor from adhering to it. The Aroclor in the rings should be fully cooled and hardened before proceeding with the test.

Procedure

Add water (Not above room temperature) to the beaker until the surface of the water is 2" above the plate holding the rings when the ring support is suspended in the beaker. Place the rings containing the Aroclor to be tested and the standard Aroclor on the ring support. Place a ball on the center of the upper surface of the Aroclor in each ring. Suspend the thermometer so that the bottom of the bulb is level with the bottom of the rings and just midway between the two rings.

Place beaker and apparatus on a 6 inch round hot plate and heat.

The temperature recorded by the thermometer at the instant the Aroclor touches the bottom plate is reported as the softening point. The heating is continued until both Aroclors have dropped to the bottom plate.

Notes

1. The standard Aroclor is run along with the sample under test in order to compensate for variations in rate of heating, dilution of flycerin, and thermometer variations.

2. Benzol is used for cleaning the rings and balls.

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3. Water can be used instead of glycerin for softening points up to 90°C.

4. For softening points above 100°C, well boiled glycerin should be used. The usual glycerin is not satisfactory as at 125 to 130°C, it boils with loss of water while the temperature remains practically constant. It is well to have a supply of high-boiling glycerin on hand to be used only for softening points above 100°C.

5. Air bubbles on the rings and balls during the test should be avoided as far as possible.

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HOLD POINT FOR AROCLORS 1168 & 1169

Description of Apparatus

The receptacle for the Aroclor is a 4-1/2 x 1" glass tube which has been sealed at one end. This tube is jacketed by a piece of asbestos paper wrapped twice around the tube and is inserted in a square eight ounce bottle which is insulated on the bottom by a layer of 1 inch asbestos fibre. The tube is held in place by a large cork. All of this insulation is used in an effort to keep the Aroclor from cooling too rapidly and it is best to get additional insualtion by wrapping the eight ounce bottle in a towel after the sample is added.

Procedure

Melt about 100 gms. of the sample in a beaker on the hot plate and pour it into the tube until it is filled within 1-1/2" of the top. The material will probably crystallize due to the cold tube and will have to be heated over a gas burner to melt it again. When it is melted insert a suitable thermometer (300-360°C) which is fitted with a cork to hold it in place. The bulb of the thermometer should be fitted in the center of the sample, care being taken that it is not too close to the side of the tube.

If the determination is made on 1169 or 1269 the tube should be heated until the thermometer reads about 300°C and it is placed in the asbestos jacket and then put in the bottle. Readings on the thermometer are taken at 30 second intervals. At first the temperature will drop rapidly (about 6° between readings) but around 250° this drop will decrease and usually a point will be reached where the drop will stop, and will either stay constant for two or more readings or will start to go back up. The correct hold point is the point at which the temperature remains constant or in case the temperature starts to go back up the highest point in this rise is taken. For example: 346, 343, 340, 338, 339, 342, 339, 337. 342°C would be the correct hold point.

In the case of 1168 or 1268 the procedure is the same except that the tube is heated to only 200°C instead of 300°C after the thermometer is inserted.

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Note / immerse thermometer well into sample. - heat sample well over hold pt

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