Introduction:

Distillation tests on Aroclors, Pyranols, and Inerteens are made essentially in accordance with the ASTM procedure D20-30 for the "Distillation of Tar Products Suitable for Road Treatment."

Apparatus:

Standard ASTM apparatus is used throughout with the following modifications:

Thermometer: Use a calibrated, 3-inch immersion, Palmer 0-400°C. range thermometer. If a full immersion thermometer is used, correction must be made for emergent stem.

Condenser: Electrically heated condenser controlled by a variac to an internal temperature of 115 ± 10°C. The variac settings, necessary for the desired temperature, for all available condensers are attached to the respective condensers. These settings were established using a variac that delivered 100 volts at a setting of 100. When variacs are changed the voltage out-put at a setting of 100 must be checked with an A.C. voltmeter. If the voltmeter reading is not within 2 volts of 100 make the necessary setting correction for the stated variac settings. The voltage correction is assumed to be linear over the entire range of the variac.

Heat Source: Electrical-rheostat control.

Material:	Point at which condenser heat should be applied:
Aroclor 1242	At beginning
Aroclor 1254	At beginning
Aroclor 1260	At beginning
Pyranol 1467) Inerteen PPO)	When a pot temperature of 250°C. is reached.
Pyranol 1470	When the distillate volume is 40 ml.
Pyranol 1481	When a pot temperature of 250°C. is reached

Procedure:

1. Weigh and transfer a 100 (± 0.05) g. sample of the product under test to the distilling flask. Take 100 ± 0.5 ml. for Pyranol 1470. Assemble the apparatus as described under ASTM D20-30.

NOTE: The electrical condenser will be a permanent set-up so that no connections will be necessary.

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2. Insert a 3-inch immersion thermometer into a cork so that the three inch (or 76 mm) line is at the bottom of the cork. Place thermometer and cork in the flask making sure the thermometer is in a vertical position. Make sure the porcelain plate is over the heating elements of the heater before placing the flask there.

3. Turn on the heat source of the flask and the condenser heat when indicated above.

4. Turn the rheostat control, for the heat source to the flask, to ca. 120. Leave in this position until exposed mercury column is within 20°C. of the approximate range of distillation.

5. When the distillation starts, reduce the rheostat (on the still-pot reading until the rate of distillation averages 50-70 drops/minute.

6. Collect the distillate into a tared flask set on a beam balance.

NOTE: Use a graduated cylinder to collect distillate for Pyranol 1470.

7. Record the temperature at the weight percentages indicated in the individual specifications for all Aroclors, Pyranols, and Inerteens with the exception of Pyranol 1470.

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8. Collect distillate of Pyranol 1470 "by volume percent" instead of "percent by weight". For this Pyranol, record the temperatures as follows:

First Drop
35% by volume
55% " "
65% " "
90% " "

9. Make the following thermometer corrections (To be added algegraically to observed temperatures):

A. Barometric Pressure:

$$C = 0.00012\ (760-P)(273 + T_c)$$

Where P = observed pressure in mm%
T_c = observed temperature in °C.

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B. Emergent Stem Correction:

If 3 inch immersion thermometer is used there is no emergent stem correction needed.

If a full immersion thermometer is used then the positive emergent stem correction is:

$$C_e = L\,(T_e - T_o)\ 0.000154$$

where L = °C. on emergent stem.
T_e = observed temperature in °C.
T_o = temperature of emergent stem at mid-point in °C.

NOTE: The use of a full-immersion thermometer is not recommended because of the difficulites involved in obtaining an accurate measurement of T_o.

Report the temperatures (corrected) to the nearest 1°C.

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