

Bag 2743 Target No. 30/4.09  
Scholven, Item 5 (B).

Determination of Aniline Point in A-Middle Oils, and Injection Products  
for 5058 Chambers

The Influence of Phenol on the Aniline Point

Previously, the aniline point determination of A-middle oil and injection product for the 5058 chamber was made the same as for benzine, 6434 catch-pot product, etc. That is, 10 cc. of the oil were mixed with 10 cc. aniline and the admixture temperature determined. As shown in Table 1, discrepancies occurred with this method of determination.

Table 1

	Aniline point - ° C.	
	<u>Scholven Product</u>	<u>Gelsenberg Product</u>
Injection product for 5058 chamber	- 11° C	- 13° C
A Middle oil - 140°-325°	- 8° C	- 12° C
A Middle oil - 185°-325°	+ 1° C	- 4.5° C
Fraction - 140°-185°	+ 16° C	+ 17° C.

According to data by Dr. Hirschberger, I. G., Ludwigshafen, in the determination of aniline point below 0° C, the to-be-investigated oil must be diluted with normal benzine in the proportion of 1:1 and the aniline point of the oil calculated from the aniline point of the mixture. As shown in Table 2, the determinations made in this manner are in agreement.

Table 2

	Aniline point determined by dilution with normal benzine	
	<u>Scholven Product</u>	<u>Gelsenberg-Product</u>
Injection product for 5058 chamber	- 19° C	- 18° C
A Middle oil - 140-325° C	- 17° C	- 19° C
A Middle oil - 185-325° C	- 21° C	- 25° C

In order to prove this method of determination we mixed normal benzine of known aniline point with increasing amounts of A Middle Oil or mixtures of A + B Middle Oils and determined the aniline point of these mixtures. The values were graphically plotted and the aniline point of the oil extrapolated. See Table 3.

An investigation of individual fractions of the injection product or A catch-pot product (Table 4) showed that the aniline point of the lower fractions of this product was lower in the direct determination than in the determination in dilution with n-benzine.

This applies especially to the fraction 185°-225°, the phenol fraction. An explanation is the poor solubility of phenol in benzine, which separates from the benzine-oil mixture at temperatures higher than the aniline point.

Table 3

	Aniline Point -- ° C			
	Determined Directly	Det'd. in Dilution with N-Benzine	Extrapolated from Curve	Calc. from Indiv. Components
A-Middle oil (133 g/l phenol)	- 8	- 19	- 21.5	
A-Middle oil (dephenolized B-Middle oil)	- 13	- 19	- 22	
2 Parts A-Middle Oil + 1 Part B-Middle oil )	3.5	3	3.5	3
3 Parts A-Middle oil Plus 1 Part B-Middle oil )	- 5.5	- 7	- 6.5	- 5
- Parts (?) A-Middle oil + 3 Parts B-Middle oil )	0	- 3	- 3.5	- 1.5
Injection product 5058	- 11	- 20	- 21	

Table 4

Aniline Point of Individual Fractions of Injection Product for 5058 Chamber

Fraction	Gelsenberg Product			Scholven Product		
	Wt. %	Aniline Point Det'd. Directly	Point Diluted N-Benzine 1:1	Wt. %	Aniline Point Det'd. Directly	Point Diluted N-Benzine 1:1
First Drop						
140°	8.2	+ 33° C	+ 33° C	1.3	+ 26° C	+ 28° C
140-185°	6.5	+ 12	+ 14	8.1	+ 20	+ 23
185-225°	20.0	- 20	- 8	23.1	- 11	- 6
225-250°	14.4	- 26	- 27	15.3	- 22	- 23
250-275°	12.8	- 11	- 33	15.4	- 19	- 30
275-300°	22.3	- 8	- 31	19.6	- 9	- 35
300-325°	12.7	+ 12	- 29	12.9	+ 4	- 32

In order to determine the influence of phenol on the aniline point, we added increasing amounts of phenol, A-middle oil, pure phenol, xylene, and crude cresol to dephenolized A-Middle oil and determined the aniline point by dilution with benzine.

Table 5

## Influence of Phenol Content on the Aniline Point

(The aniline point was determined in dilution with N-benzine. The phenols were added to dephenolized A-Middle oil (A.P. -19°).

Amount phenol added, g/l	Aniline point in the case of addition of:			
	Pure phenol	Xylene	Crude Cresol	Phenol from A-Middle Oil
30	-18° C	-19° C	-19° C	-19° C
60	-17	-22	-19	-19
90	-15	-24	-17	-19
120	-11	-24	-19	-19
150	-11	-23	-19	-18
180	-10	-24	-19	-15
250	- 5	-25	-20	-17

Phenols influence the aniline point in various ways. The higher phenols have only a slight effect on the aniline point. In the case of a very high phenol content the aniline point can rise somewhat. Lower phenols

increase the aniline point considerably. This behavior is exactly opposite to the effect on the aniline point previously known for aromatic compounds.

Thus, in the case of products with high phenol content, such as A-Middle oil, the aniline point is determined on dephenolized products diluted with N-benzine (1:1).

Table 6

Aniline Point of Phenol-Containing and Dephenolized Plant Products (Diluted with n-benzine 1:1)

	<u>Phenol g/l</u>	<u>Phenol cont'g. Product</u>	<u>Dephenolized Product</u>
Scholven injection product for 5058 chambers	142	-19° C	-20° C
Gelsenberg injection product for 5058 chambers	107	-18	-17
A-Middle oil (Scholven)	133	-17	-19
A-Middle oil (Gelsenberg)	131	-21	-19

Buer-Scholven, June 3, 1940.