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ENGINEERING RESEARCH INSTITUTE
THE UNIVERSITY OF MICHIGAN
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Final Report (Appendix II)

SPECIAL INVESTIGATION OF ASPHALT RECOVERED FROM MIXTURES
OF ORIGINAL AND RE-USED AGGREGATE FROM MICHIGAN
AND MINNESOTA SOURCES AFTER (n) TYPE EXPOSURE

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The basic report consists of data from which it is possible to compare the behavior of the asphalts when mixed with different aggregate and subjected to various degrees of exposure. The proportions of the mixtures were practically identical. The exposures varied and have been identified by letter symbols (a) to (n). These are summarized on the title page of each table or graph and are included in the text of the basic report.

With the exception of exposures (k) and (l), which consisted of 60-day outdoor weathering, all were conducted under laboratory conditions and varied with respect to aggregate, temperature, and duration.

In general, it required the more severe laboratory exposures to develop pronounced contrast in the behavior of the three asphalts. In exposure (n), the aggregate was heated to 350°F and the asphalt to 300°F prior to mixing for 1 minute. The loosely spread mixture was heated for 180 minutes in a force-draft oven at 325°F. It was then cooled and the asphalt was recovered and tested. This test was the most severe of the series and was especially effective in changing the spot characteristics.

A limited number of (n) exposures were included in the initial testing in which spot characteristics were determined with Skelly "S" and straight xylene solvent. The severe exposure accelerated change in the asphalt and appeared to be useful in determining the cause of a previously observed reduction in the weight of the recovered asphalt from that initially incorporated in the mixture.

The degree of heterogeneity of the recovered asphalt, as reflected by its spot characteristics was explored by varying the percent of xylene in heptane solvent, in addition to the previously used Skelly "S" and straight xylene.

The results of all preceding extraction and recovery of asphalt from fresh aggregate mixtures indicated a universal decrease in the recovered weight. Subsequent tests of the recovered asphalt showed changes in the relative proportions of asphaltenes, oily constituents, and resins. This change was manifest in the decrease of the resin/asphaltene (R/A) ratio. The extraction and recovery of asphalt followed the procedure described by A.S.T.M. Designation: D762-49, "Standard Method of Test for Hot Extraction of Asphaltic Materials and Recovery of Bitumen by the Modified Abson Procedure." Special care was exercised to insure complete recovery. The sample was weighed to the nearest gram. The benzene solvent was recycled for one hour or more after benzene became apparently colorless, during which time the mixture was stirred and agi-

tated every 15 minutes. The extractor was thoroughly flushed with fresh benzene, all vessels and utensils washed, the collective solvent and included material recaptured, solvent distilled, and residue centrifuged and supercentrifuged.

It was considered possible that a small portion of the original asphalt was absorbed or absorbed by the original aggregate, in which case such retention might modify the decrease in quantity and properties of the same fresh asphalt when combined with and recovered from aggregate reclaimed from previous mixtures.

The test data are tabulated on page 6 and the percent change in the physical properties is shown on page 7. The results of the spot tests, which constitute a major portion of this supplemental investigation, have been photographed and are included on pages 9 to 92.

Data from the tables are on page 5. The average of three tests for each asphalt is reported. The letters (O) and (R) signify the original and re-used aggregate, respectively. Test results appearing in the basic report relative to (n) exposure have been included. Their similarity to the supplemental test values is of interest.

Leonard asphalt will be reviewed separately. Penetration of asphalt recovered from the mixture of original Michigan aggregate was 0.40%, the softening point, 1.89%, and the softening point-penetration ratio was 9.06% less than for re-used. Although the difference is quite small, it is not as anticipated because the asphalt components presumably remaining on the re-used aggregate did not contribute in reducing the change. Only a minor difference may be noted in the spot characteristics of the asphalt recovered from original and re-used aggregate.

In the case of the Minnesota aggregate, the comparison between the characteristics of the asphalt recovered from original and re-used mixtures is more consistent with the initial hypothesis that the percentage change is reduced due to retention by the aggregate of some component of the asphalt. Penetration of asphalt from the re-used aggregate decreased 2.0%, softening point, 3.17%, and softening point-penetration ratio, 70.50%, as compared to the asphalt recovered from the original aggregate mixture. Only minor difference occurred in the spot tests.

There were greater changes in the asphalts recovered from Minnesota aggregate mixtures than in those recovered from Michigan aggregate. An inspection of the tabulated values will readily disclose this behavior with respect to penetration, softening point, softening point-penetration ratio and in the spot tests, particularly in the case of Skelly and above 25% xylene—75% heptane solvents.

The individual appraisal of Lion asphalt indicates decreases of 1.05%,

2.36%, and 20.06% in penetration, softening point, and softening point-penetration ratio, respectively, in the re-used aggregate mixtures as compared with the initial Michigan aggregate. With Minnesota aggregate the trend is partially reduced or reversed. Penetration increased 0.35%, softening point increased 0.47%, and softening point-penetration ratio decreased 0.17%. These differences are practically immaterial as are the variations in spot tests.

Test results on Trumbull asphalt mixtures with Michigan original and re-used aggregate indicate an appreciable change. A decrease of 6.59%, 6.96%, and 109.48% occurred in penetration, softening point, and softening point-penetration ratio, respectively, for asphalt recovered from re-used aggregate. Spot-test results are very similar with original and re-used aggregate. With Minnesota aggregate, the change is reversed. With the re-used aggregate the change was 1.55%, 4.27%, and 93.11% greater in penetration, softening point, and softening point-penetration ratio. There is little difference in spot-test results.

The following performance ratings of the three test asphalts were formulated by using the criterion of least change to indicate behavior under (n) exposure. Asphalt performance is compared by (1) best, (2) intermediate, and (3) least favorable. An arbitrary rating of +5 for negative spot, -2 for ring, -3 for trace, -4 for slightly positive, and -5 for positive spot were used to evaluate the results of the spot tests.

Rating of Leonard, Lion, and Trumbull Asphalt

Penet	Soft Pt	Soft Pt/ Pen Ratio	Skelly	100% Xylene	% Xylene in Heptane					
					10%	15%	20%	25%	30%	35%
<u>Original Michigan Aggregate</u>										
L (1)	OL (1)	L (1)	+15	+15	-15	-15	- 9	+ 8	+15	+15
OL (2)	L (2)	OL (2)	+ 8	+15	-15	-12	-15	- 6	+ 1	+ 8
OT (3)	OT (3)	OT (3)	- 6	+15	-15	-15	-15	-15	- 9	+ 1
<u>Re-Used Michigan Aggregate</u>										
L (1)	L (1)	L (1)	+15	+15	-15	-15	- 6	+15	+15	+15
OT (2)	OL (2)	OT (2)	- 6	+15	-15	-15	-15	-15	- 9	+ 8
OL (3)	OT (3)	OL (3)	+ 8	+15	-15	-12	-15	-12	- 6	+15
<u>Original Minnesota Aggregate</u>										
L (1)	L (1)	L (1)	+15	+15	-15	-15	- 9	+15	+15	+15
OL (2)	OL (2)	OL (2)	+ 1	+15	-15	-15	-15	-12	- 9	+ 8
OT (3)	OT (3)	OT (3)	- 6	+15	-15	-15	-15	-15	-12	+ 1
<u>Re-Used Minnesota Aggregate</u>										
L (1)	OL (1)	L (1)	+15	+15	-15	-15	-15	+ 8	+15	+15
OL (2)	L (2)	OL (2)	- 6	+15	-15	-12	-15	- 9	- 9	+ 1
OT (3)	OT (3)	OT (3)	- 6	+15	-15	-15	-15	-15	-15	- 6

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The preceding table has been condensed below to facilitate interpretation of test results. The percent change of the asphalts with respect to penetration, softening point, and softening point-penetration ratio is listed in order of their performance. The arbitrary numerical ratings of spot tests for each condition and solvent have been added algebraically. For example, 3 negative spots are indicated by a value of +15, 3 positive spots by -15. A combination of 1 positive and 2 ring spots would have a value of -9 whereas 1 negative and 2 ring spots would be indicated by +1.

Penet	Michigan Aggregate			Original or Re-Used	Minnesota Aggregate			
	Soft Pt	Soft Pt/ Pen Ratio	Spot		Penet	Soft Pt	Soft Pt/ Pen Ratio	Spot
L	OL	L	L +29	Original	L	L	L	L +36
OL	L	OL	OL -14	Original	OL	OL	OL	OL -43
OT	OT	OT	OT -53	Original	OT	OT	OT	OT -62
L	L	L	L +39	Re-used	L	OL	L	L +23
OT	OL	OT	OL -22	Re-used	OL	L	OL	OL -50
OL	OT	OL	OT -52	Re-used	OT	OT	OT	OT -72

Note: L = Lion Asphalt OL = Leonard Asphalt OT = Trumbull Asphalt

Based on (n) exposure, percent change in test values, and the arbitrary relative numerical scale for spots, evaluation of asphalt behavior may be in terms of performance as Lion, Leonard, and Trumbull, regardless of source or condition of aggregate.

With regard to spot test for asphalt recovered from Michigan aggregate mixtures, Lion asphalt improved, Leonard deteriorated, and Trumbull improved with re-used aggregate. With Minnesota aggregate, the spot scale values all deteriorated with re-used material. These results do not confirm the preliminary hypothesis that re-used aggregate might tend to reduce change in the asphalt.

Conclusions relative to the foregoing test results will be incorporated in the basic report.

SUMMARY OF TESTS AFTER (n) EXPOSURE

Source Agg	Penet at 77°F %	Soft Pt °F %	Soft Pt/ Pen Ratio %	Skelly	% Xylene in Heptane						
					100% Xylene	10%	15%	20%	25%	30%	35%
<u>Leonard Asphalt</u>											
Mich (O)	-69.9	+25.5	+336.0	1 Ring 5 Neg	6 Neg	3 Pos	1 Ring 2 Pos	3 Pos	3 Ring 1 Ring	2 Ring 1 Neg	1 Ring 2 Neg
Mich (R)	-71.08	+26.16	+336.57	2 Neg 2 Ring	3 Neg	3 Pos	1 Ring 2 Pos	3 Pos	2 Pos 1 Ring	3 Ring 2 Ring	3 Neg 1 Ring
Minn (O)	-78.71	+40.49	+560.38	1 Neg	3 Neg	3 Pos	3 Pos	3 Pos	2 Pos 2 Ring	1 Pos 2 Ring	2 Neg 2 Ring
Minn (R)	-76.71	+37.32	+489.88	3 Ring	3 Neg	3 Pos	1 Ring 2 Pos	3 Pos	1 Pos	1 Pos	1 Neg
<u>Lion Asphalt</u>											
Mich (O)	-67.72	+26.86	+297.59	3 Neg	3 Neg	3 Pos	3 Pos	2 Ring 1 Pos	1 Ring 2 Neg	3 Neg	3 Neg
Mich (R)	-66.67	+24.50	+277.53	3 Neg	3 Neg	3 Pos	3 Pos	2 Ring	3 Neg	3 Neg	3 Neg
Minn (O)	-72.63	+36.86	+409.95	3 Neg	3 Neg	3 Pos	3 Pos	1 Pos	3 Neg	3 Neg	3 Neg
Minn (R)	-72.98	+37.33	+409.78	3 Neg	3 Neg	3 Pos	3 Pos	3 Pos	1 Ring 2 Neg	3 Neg	3 Neg
<u>Trumbull Asphalt</u>											
Mich (O)	-74.81	+33.34	+431.64	3 Ring	3 Neg	3 Pos	3 Pos	3 Pos	3 Pos	2 Ring 1 Pos	2 Ring 1 Neg
Mich (R)	-68.22	+26.38	+322.16	3 Ring	3 Neg	3 Pos	3 Pos	3 Pos	3 Pos	2 Ring 1 Pos	1 Ring 2 Neg
Minn (O)	-81.78	+43.37	+697.93	3 Ring	3 Neg	3 Pos	3 Pos	3 Pos	3 Pos	1 Ring	2 Ring
Minn (R)	-83.33	+47.64	+791.04	3 Ring	3 Neg	3 Pos	3 Pos	3 Pos	3 Pos	2 Pos 3 Pos	1 Neg 3 Ring
<u>Leonard Asphalt (Summary of First Series (n) Exposure)</u>											
Mich (O)	-71.08	+23.10	+325.61	Sl Pos	Neg						
Minn (O)	-77.11	+41.20	+316.69	Pos	Neg						
<u>Lion Asphalt</u>											
Mich (O)	No test made										
Minn (O)	-71.58	+32.61	+366.50	Neg	Neg						
<u>Trumbull Asphalt</u>											
Mich (O)	-77.91	+39.76	+532.60	Pos	Neg						
Minn (O)	-68.60	+23.54	+293.54	Sl Pos	Neg						
<u>Original Asphalt Tested January 28, 1957, Referred to Original Asphalt Tested February, 1956</u>											
Leonard	- 6.02	+ 2.38	+ 8.85	Neg	Neg	Pos	Pos	Ring	Neg	Neg	Neg
Lion	- 7.37	+ 3.11	+11.31	Neg	Neg	Ring	Neg	Neg	Neg	Neg	Neg
Trumbull	- 4.65	- 0.17	+ 4.71	Neg	Neg	Pos	Pos	Ring	Ring	Neg	Neg

Special Test Series

Engineering Research Institute Project 2249

Ohio Oil Company, Findlay, Ohio
 Mixing, extraction, recovery, and standard tests
 on Leonard, Lion, and Trumbull asphalt after
 mixing with original and re-used Michigan and
 Minnesota aggregate after (n) exposure.

Test No.	Asphalt	Source	Aggregate	Penetration Orig	Penetration Rcvd	Soft Point		Soft Pt./Pen Ratio Orig	Skelly Spot	Skelly Spot	Xylene Spot	% Xylene in Heptane					
						Orig	Rcvd					10%	15%	20%	25%	30%	
N1 A	OL 85 - 100	Leonard	Mich (O)	83	21	115.3	150.8	1.390	7.181	Neg	---	Pos	Pos	Pos	Pos	Pos	Pos
N2 A	OL 85 - 100	Leonard	Mich (O)	83	21	115.3	151.3	1.390	7.205	Neg	---	Pos	Pos	Pos	Pos	Pos	Pos
N3 A	OL 85 - 100	Leonard	Mich (O)	83	22	115.3	151.2	1.390	6.873	Neg	---	Pos	Pos	Pos	Pos	Pos	Pos
N1 B	OL 85 - 100	Leonard	Mich (R)	83	31	115.3	155.7	1.390	4.377	Neg	---	Pos	Pos	Pos	Pos	Pos	Pos
N2 B	OL 85 - 100	Leonard	Mich (R)	83	22	115.3	151.2	1.390	6.875	Ring	---	Pos	Pos	Pos	Pos	Pos	Pos
N3 B	OL 85 - 100	Leonard	Mich (R)	83	23	115.3	145.58	1.390	6.350	Neg	---	Pos	Pos	Pos	Pos	Pos	Pos
N1 A	OL 85 - 100	Leonard	Mich (O)	83	23	115.3	148.82	1.390	6.470	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 A	OL 85 - 100	Leonard	Mich (O)	83	26	115.3	136.40	1.390	5.246	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 A	OL 85 - 100	Leonard	Mich (O)	83	24	115.3	144.68	1.390	6.068	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 B	OL 85 - 100	Leonard	Mich (R)	83	25	115.3	145.22	1.390	5.809	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 B	OL 85 - 100	Leonard	Mich (R)	83	24	115.3	145.58	1.390	6.066	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 B	OL 85 - 100	Leonard	Mich (R)	83	23	115.3	145.58	1.390	6.350	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 A	OL 85 - 100	Leonard	Minn (O)	83	17	115.3	165.4	1.390	9.612	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 A	OL 85 - 100	Leonard	Minn (O)	83	18	115.3	165.04	1.390	9.058	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 A	OL 85 - 100	Leonard	Minn (O)	83	18	115.3	159.62	1.390	8.868	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 B	OL 85 - 100	Leonard	Minn (R)	83	20	115.3	154.4	1.390	7.720	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 B	OL 85 - 100	Leonard	Minn (R)	83	19	115.3	161.60	1.390	8.505	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 B	OL 85 - 100	Leonard	Minn (R)	83	19	115.3	159.08	1.390	8.373	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 A	L 85 - 100	Lion	Mich (O)	95	35	114.3	141.3	1.205	4.037	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 A	L 85 - 100	Lion	Mich (O)	95	29	114.3	144.0	1.205	4.966	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 A	L 85 - 100	Lion	Mich (O)	95	28	114.3	149.7	1.205	3.346	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 B	L 85 - 100	Lion	Mich (R)	95	35	114.3	137.7	1.205	3.934	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 B	L 85 - 100	Lion	Mich (R)	95	28	114.3	146.5	1.205	5.232	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 B	L 85 - 100	Lion	Mich (R)	95	32	114.3	142.7	1.205	4.459	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 A	L 85 - 100	Lion	Minn (O)	95	29	114.3	148.8	1.205	5.131	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 A	L 85 - 100	Lion	Minn (O)	95	22	114.3	166.6	1.205	7.373	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 A	L 85 - 100	Lion	Minn (O)	95	27	114.3	153.9	1.205	5.700	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 B	L 85 - 100	Lion	Minn (R)	95	27	114.3	156.2	1.205	5.785	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 B	L 85 - 100	Lion	Minn (R)	95	26	114.3	156.0	1.205	6.000	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 B	L 85 - 100	Lion	Minn (R)	95	24	114.3	158.7	1.205	6.615	Neg	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 A	OT 85 - 100	Trumbull	Mich (O)	86	23	113.2	149.0	1.316	6.478	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 A	OT 85 - 100	Trumbull	Mich (O)	86	22	113.2	149.4	1.316	6.791	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 A	OT 85 - 100	Trumbull	Mich (O)	86	32	113.2	154.4	1.316	7.720	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 B	OT 85 - 100	Trumbull	Mich (R)	86	32	113.2	134.4	1.316	4.200	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 B	OT 85 - 100	Trumbull	Mich (R)	86	30	113.2	136.4	1.316	4.547	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 B	OT 85 - 100	Trumbull	Mich (R)	86	20	113.2	158.4	1.316	7.920	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 A	OT 85 - 100	Trumbull	Minn (O)	86	18	113.2	156.4	1.316	8.689	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 A	OT 85 - 100	Trumbull	Minn (O)	86	14	113.2	165.9	1.316	11.707	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 A	OT 85 - 100	Trumbull	Minn (O)	86	15	113.2	166.6	1.316	11.107	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N1 B	OT 85 - 100	Trumbull	Minn (R)	86	16	113.2	165.9	1.316	11.060	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N2 B	OT 85 - 100	Trumbull	Minn (R)	86	13	113.2	170.8	1.316	13.138	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos
N3 B	OT 85 - 100	Trumbull	Minn (R)	86	15	113.2	164.7	1.316	10.980	Ring	Neg	Pos	Pos	Pos	Pos	Pos	Pos

Special Test Series

Engineering Research Institute Project 2249
 Ohio Oil Company, Findlay, Ohio
 Percent change from original for recovered Leonard, Lion, and Trumbull asphalt from mixtures with original and re-used Michigan and Minnesota aggregate after (n) exposure.

A.C.	Aggregate	Composition			O/A	R/A	R/O	Penet	% Change		Soft Pt/ Pen Ratio	Skelly Spot	Xylene Spot	% Xylene in Heptane						
		Asphtns %	Oils %	Resin %					Soft Pt F	10%				15%	20%	25%	30%	35%		
Leonard	Mich (O)				-74.60			+30.79		+416.62	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (O)				-74.60			+31.22		+418.35	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (O)				-61.45			+17.95		+205.76	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (R)				-73.49			+31.14		+394.46	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (R)				-62.65			+17.69		+214.89	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (R)	Not included in this test series.			-73.49			+31.14		+394.60	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (O)				-72.29			+29.03		+363.47	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Leonard	Mich (O)				-68.67			+18.30		+277.41	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (O)				-71.08			+25.48		+333.66	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (R)				-69.88			+25.95		+317.91	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (R)				-71.08			+26.26		+336.40	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Mich (R)	Not included in this test series.			-72.29			+26.26		+353.39	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Minn (O)				-79.32			+41.72		+591.51	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Minn (O)				-78.31			+41.36		+531.65	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Leonard	Minn (O)				-78.31			+38.39		+537.99	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Leonard	Minn (R)				-75.90			+33.92		+455.40	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Minn (R)				-77.11			+40.11		+511.87	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Leonard	Minn (R)	Not included in this test series.			-77.11			+37.92		+502.37	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Lion	Mich (O)				-63.16			+23.62		+233.58	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Mich (O)				-69.47			+25.98		+312.80	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Mich (O)				-70.33			+30.97		+344.39	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Mich (R)				-65.16			+20.47		+227.02	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Mich (R)				-70.33			+28.17		+334.92	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Mich (R)	Not included in this test series.			-66.32			+24.85		+270.66	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Minn (O)				-69.47			+30.18		+326.32	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Minn (O)				-76.84			+45.76		+529.51	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Minn (R)				-71.58			+34.65		+373.82	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Minn (R)				-71.58			+36.66		+380.88	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Minn (R)				-72.63			+36.48		+398.76	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Lion	Minn (R)	Not included in this test series.			-74.74			+38.85		+449.71	Neg			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Trumbull	Mich (O)				-73.26			+31.63		+392.25	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Trumbull	Mich (O)				-74.42			+31.98		+416.03	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Trumbull	Mich (O)				-76.74			+36.40		+486.63	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Trumbull	Mich (R)				-62.79			+18.73		+219.15	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Trumbull	Mich (R)				-65.12			+20.49		+245.92	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Trumbull	Mich (R)	Not included in this test series.			-76.74			+39.33		+501.82	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Trumbull	Minn (O)				-79.07			+38.16		+560.26	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Trumbull	Minn (O)				-83.72			+44.79		+789.52	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Trumbull	Minn (O)				-82.56			+47.17		+744.00	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Trumbull	Minn (R)				-82.56			+46.55		+740.43	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Neg
Trumbull	Minn (R)				-84.88			+50.88		+896.33	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring
Trumbull	Minn (R)	Not included in this test series.			-82.56			+45.49		+734.35	Ring			Pos	Pos	Pos	Pos	Pos	Pos	Ring

PICTURES OF SPOT TESTS

N1A-OL Mich



Skelly

N1A-OL Mich



10% Xylene

N1A-OL Mich



15% Xylene

N1A-OL Mich



20% Xylene

N1A-OL Mich



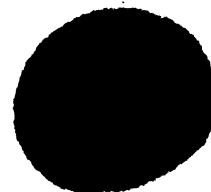
25% Xylene

N1A-OL Mich



30% Xylene

N1A-OL Mich



35% Xylene

N2A-OL Mich



Skelly

N2A-OL Mich



10% Xylene

N2A-OL Mich



15% Xylene

N2A-OL Mich



20% Xylene

N2A-OL Mich



25% Xylene

N2A-OL Mich



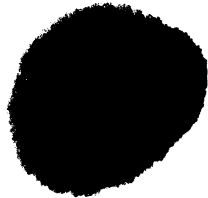
30% Xylene

N2A-OL Mich



35% Xylene

N3A-OL Mich



Skelly

N3A-OL Mich



10% Xylene

N3A-OL Mich



15% Xylene

N3A-OL Mich



20% Xylene

N3A-OL Mich



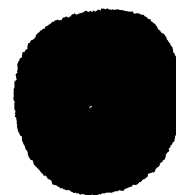
25% Xylene

N3A-OL Mich



30% Xylene

N3A-OL Mich



35% Xylene

N1B-OL Mich



Skelly

N1B-OL Mich



10% Xylene

N1B-OL Mich



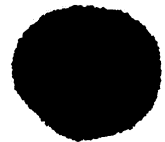
15% Xylene

N1B-OL Mich



20% Xylene

N1B-OL Mich



25% Xylene

N1B-OL Mich



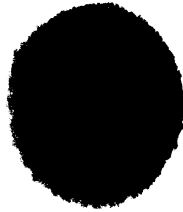
30% Xylene

N1B-OL Mich



35% Xylene

N2B-OL Mich



Skelly

N2B-OL Mich



10% Xylene

N2B-OL Mich



15% Xylene

N2B-OL Mich



20% Xylene

N2B-OL Mich



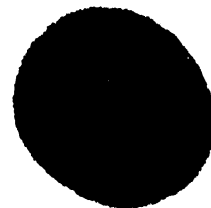
25% Xylene

N2B-OL Mich



30% Xylene

N2B-OL Mich



35% Xylene

N3B-OL Mich



Skelly

N3B-OL Mich



10% Xylene

N3B-OL Mich



15% Xylene

N3B-OL Mich



20% Xylene

N3B-OL Mich



25% Xylene

N3B-OL Mich



30% Xylene

N3B-OL Mich



35% Xylene

NIRA-OL Mich



Skelly

NRIA-OL Mich



Xylene

NIRA-OL Mich



NIRA-OL Mich



Xylene



Xylene



10% Xylene

15% Xylene

NIRA-OL Mich



NIRA-OL Mich



Xylene

Xylene

20% Xylene

25% Xylene

NIRA-OL Mich



NIRA-OL Mich



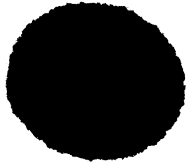
Xylene

Xylene

30% Xylene

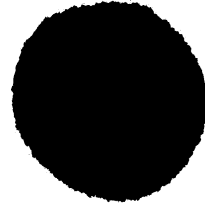
35% Xylene

NR2A-OL Mich



Skelly

NR2A-OL Mich



Xylene

NR2A-OL Mich



Xylene

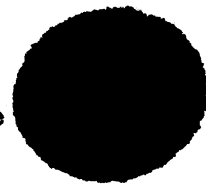


10% Xylene

NR2A-OL Mich



Xylene



15% Xylene

NR2A-OL Mich



Xylene

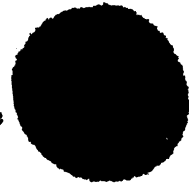


20% Xylene

NR2A-OL Mich



Xylene



25% Xylene

NR2A-OL Mich



Xylene



30% Xylene

NR2A-OL Mich



Xylene



35% Xylene

NR3A-OL Mich



Skelly

N3RA-OL Mich



Xylene

N3RA-OL Mich



Xylene



10% Xylene

N3RA-OL Mich



Xylene



15% Xylene

NR3A-OL Mich

N3RA-OL Mich

Xylene

Xylene

20% Xylene

25% Xylene

N3RA-OL Mich

NR3A-OL Mich

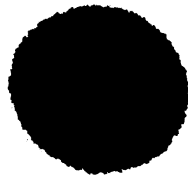
Xylene

Xylene

30% Xylene

35% Xylene

Skelly



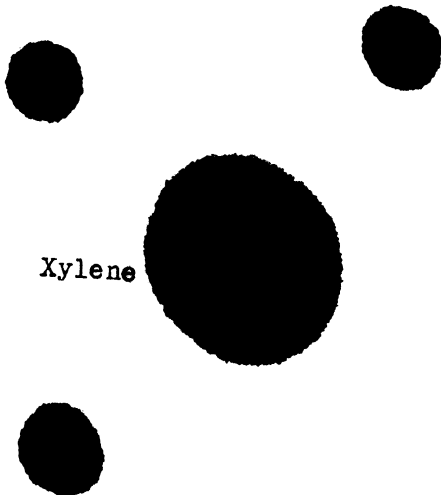
NR1B-OL Mich

Xylene



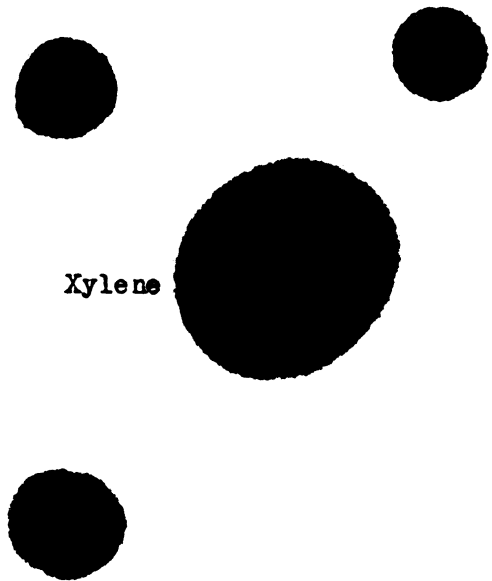
NR1B-OL Mich

10% Xylene

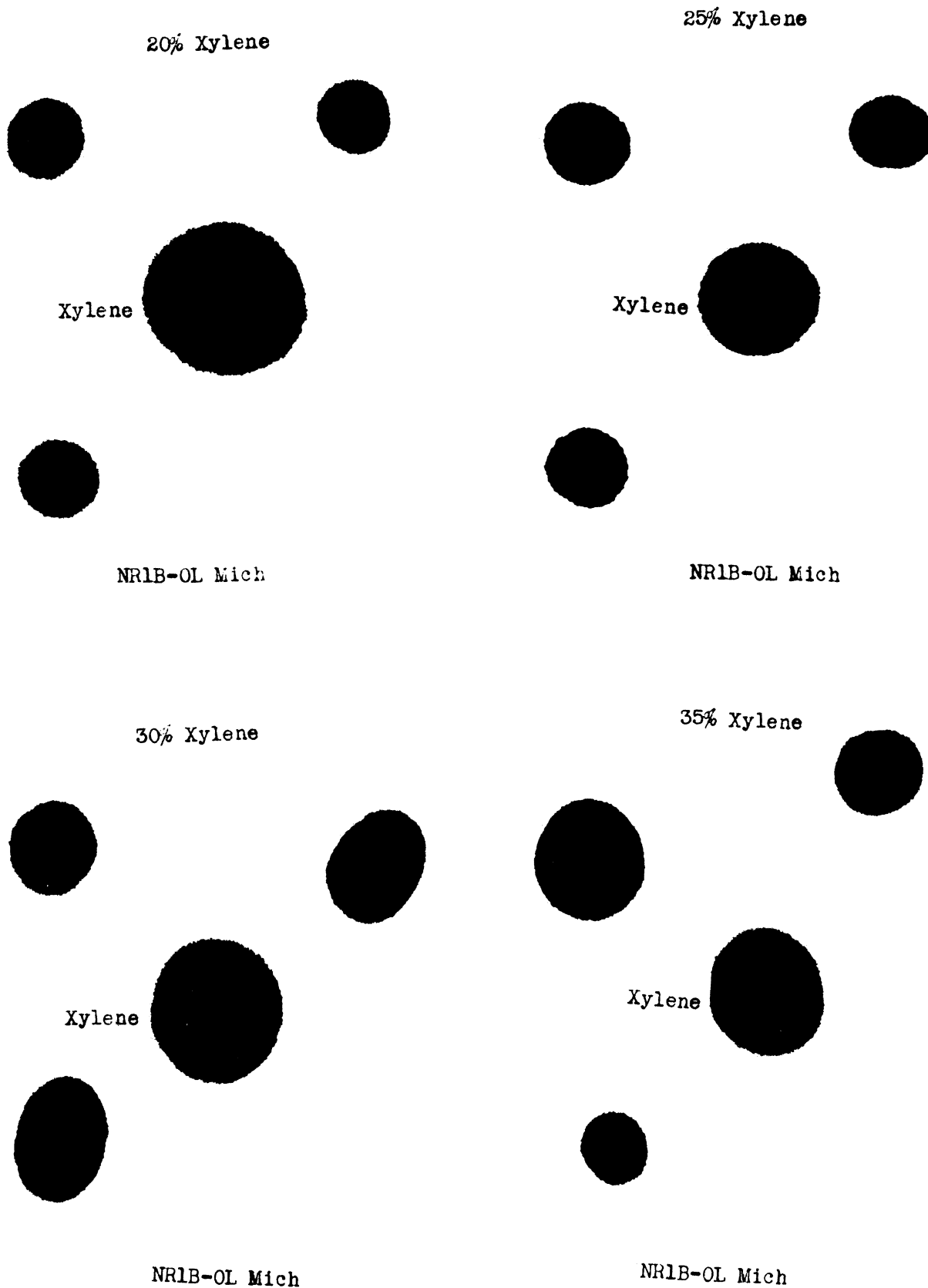


NR1B-OL Mich

15% Xylene



NR1B-OL Mich



NR2B-OL Mich



Skelly

NR2B-OL Mich



Xylene

NR2B-OL Mich

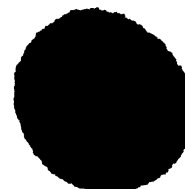


Xylene



NR2B-OL Mich

Xylene



10% Xylene

15% Xylene

NR2B-OL Mich



Xylene



20% Xylene

NR2B-OL Mich



Xylene



25% Xylene

NR2B-OL Mich



Xylene



30% Xylene

NR2B-OL Mich



Xylene



35% Xylene

NR3B-OL Mich



Skelly

NR3B-OL Mich

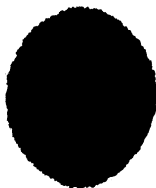


Xylene

NR3B-OL Mich



Xylene

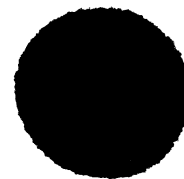


10% Xylene

NR3B-OL Mich



Xylene



15% Xylene

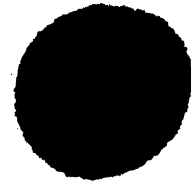
NR3B-OL Mich

NR3B-OL Mich



Xylene

Xylene



20% Xylene

25% Xylene

NR3B-OL Mich

NR3B-OL Mich



Xylene

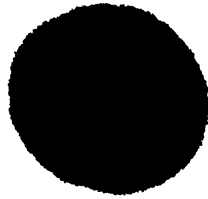
Xylene



30% Xylene

35% Xylene

NIA-OL Minn



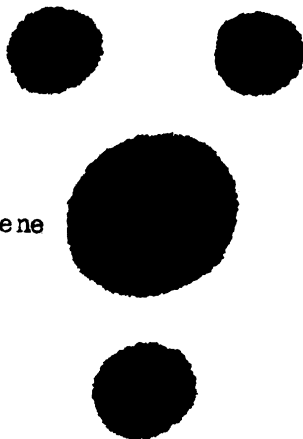
Skelly

NIA-OL Minn



Xylene

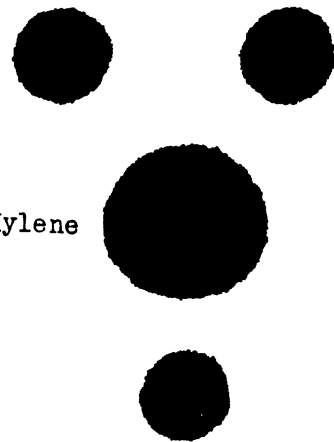
NIA-OL Minn



Xylene

10% Xylene

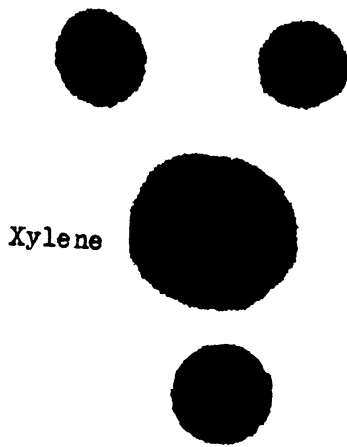
NIA-OL Minn



Xylene

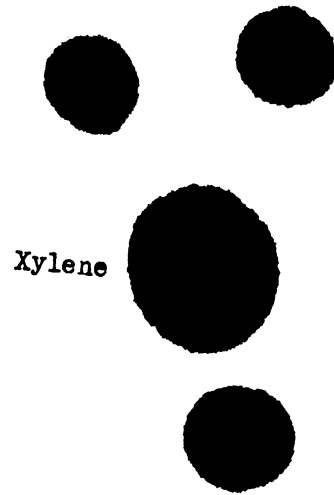
15% Xylene

NIA-OL Minn



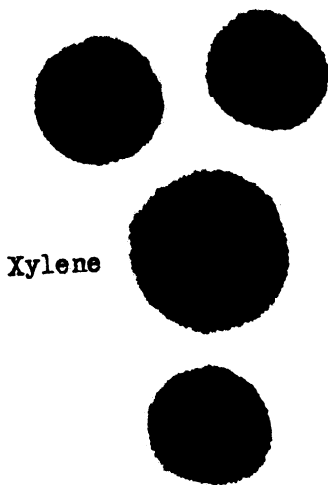
20% Xylene

NIA-OL Minn



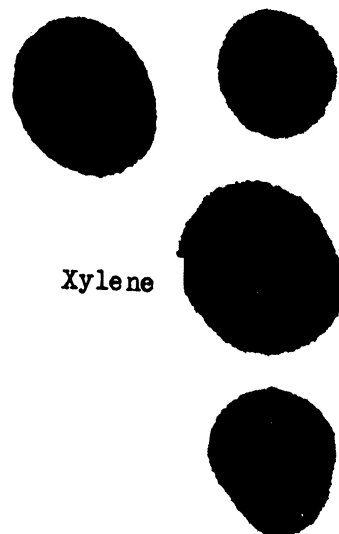
25% Xylene

NIA-OL Minn



30% Xylene

NIA-OL Minn



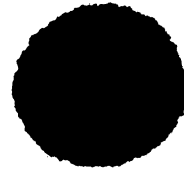
35% Xylene

N2A-OL Minn



Skelly

N2A-OL Minn



Xylene

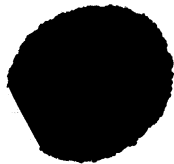
N2A-OL Minn



N2A-OL Minn



Xylene



Xylene

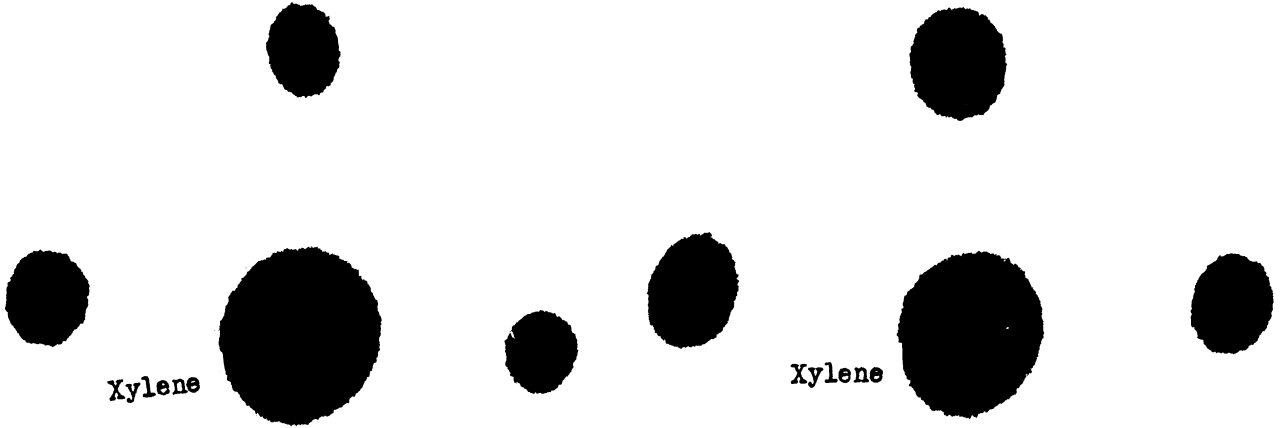


10% Xylene

15% Xylene

N2A-OL Minn

N2A-OL Minn

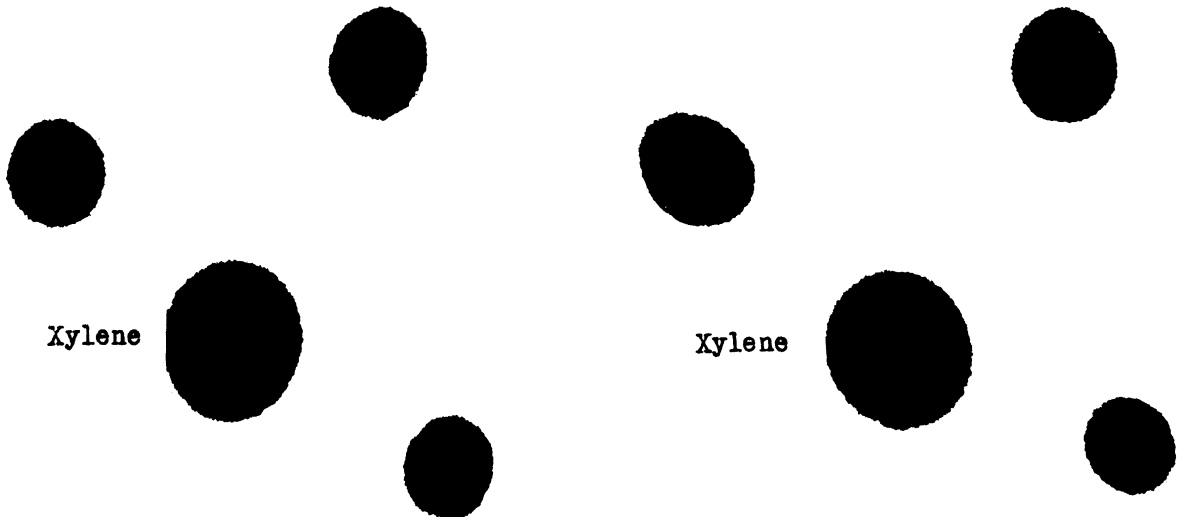


20% Xylene

25% Xylene

N2A-OL Minn

N2A-OL Minn



30% Xylene

35% Xylene

N3A-OL Minn



Skelly

N3A-OL Minn



Xylene

N3A-OL Minn



N3A-OL Minn



Xylene



Xylene

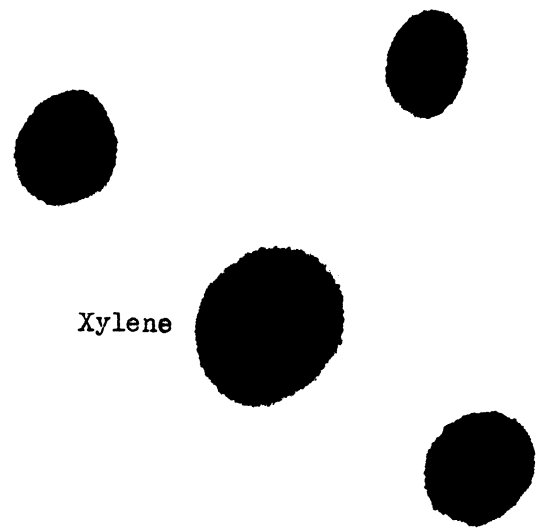
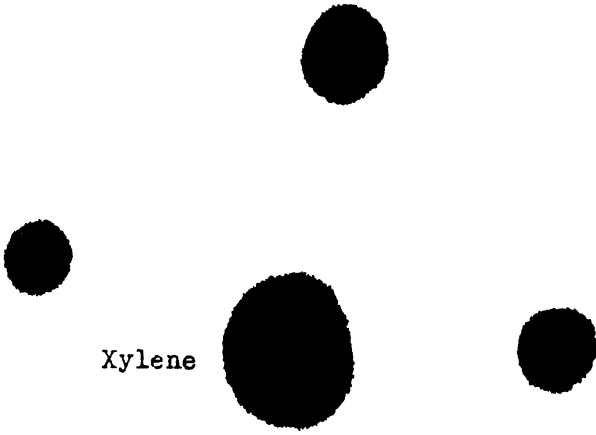


10% Xylene

15% Xylene

N3A-OL Minn

N3A-OL Minn

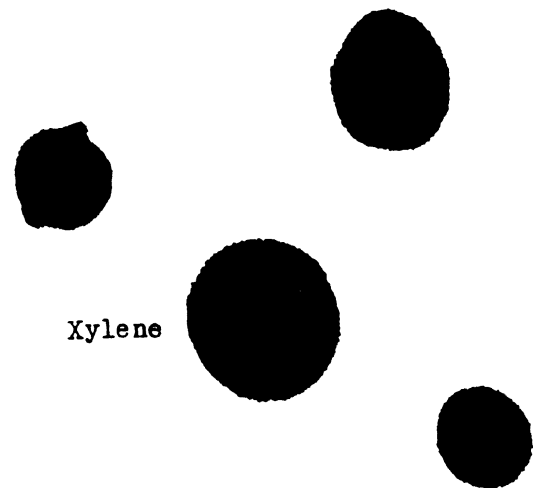
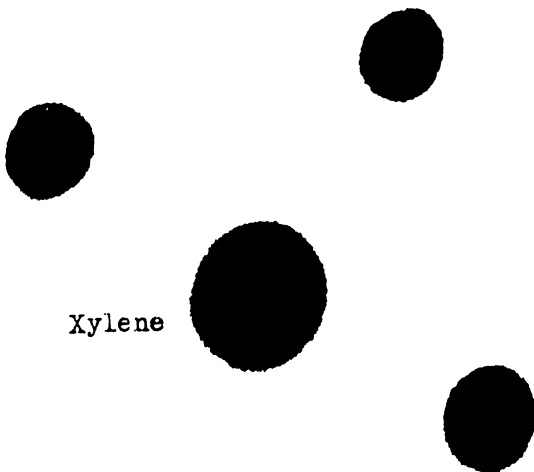


20% Xylene

25% Xylene

N3A-OL Minn

N3A-OL Minn



30% Xylene

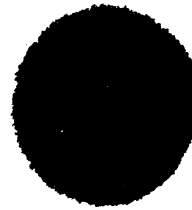
35% Xylene

N1B-OL Minn



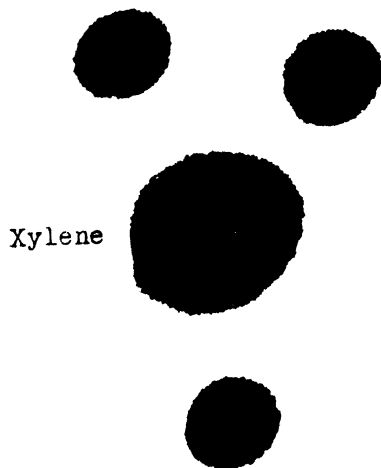
Skelly

N1B-OL Minn



Xylene

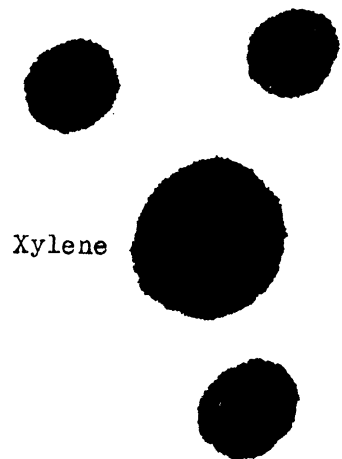
N1B-OL Minn



Xylene

10% Xylene

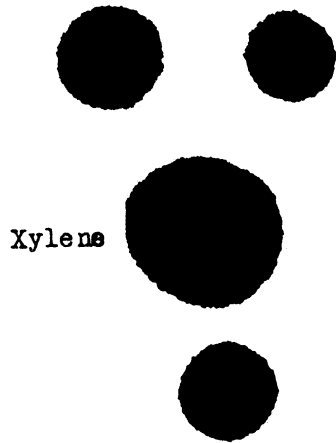
N1B-OL Minn



Xylene

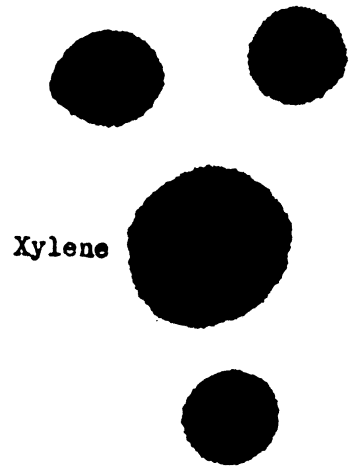
15% Xylene

N1B-OL Minn



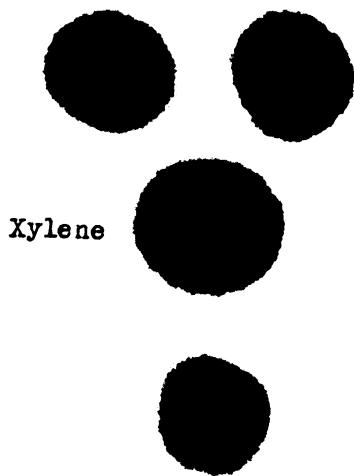
20% Xylene

N1B-OL Minn



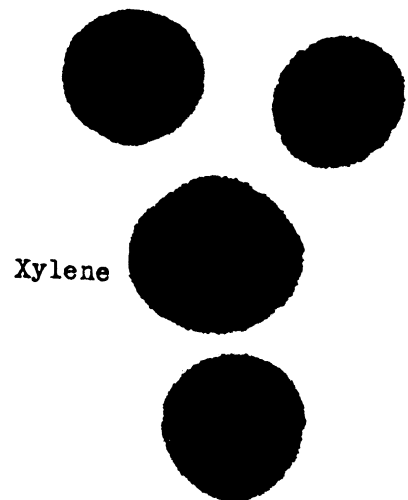
25% Xylene

N1B-OL Minn



30% Xylene

N1B-OL Minn



35% Xylene

N2B-OL Minn



Skelly

N2B-OL Minn



Xylene

N2B-OL Minn



N2B-OL Minn



Xylene



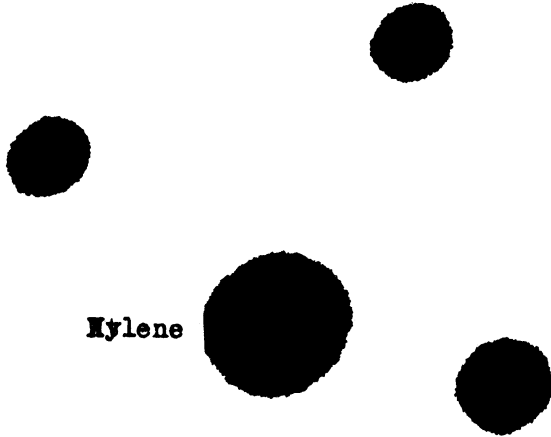
Xylene



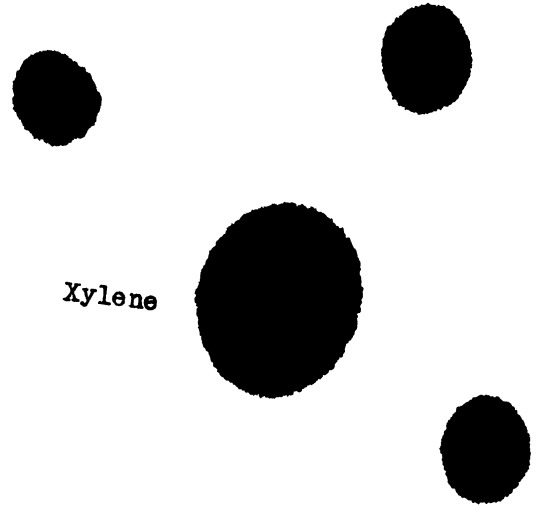
10% Xylene

15% Xylene

N2B-OL Minn

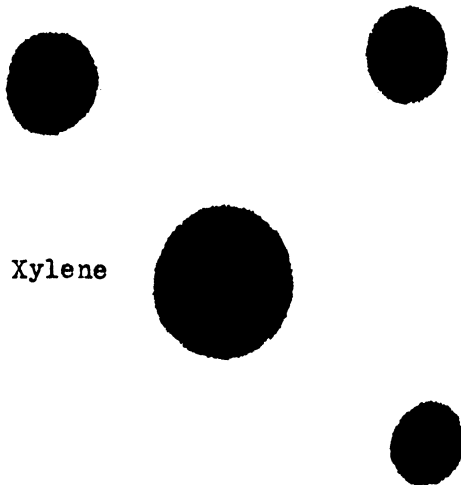


N2B-OL Minn



20% Xylene

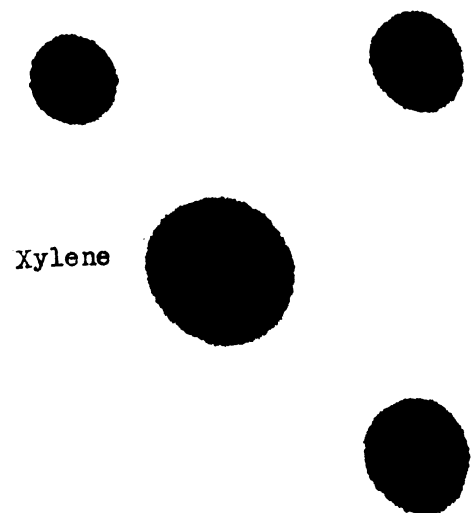
N2B-OL Minn



30% Xylene

25% Xylene

N2B-OL Minn



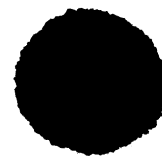
35% Xylene

N3B-OL Minn



Skelly

N3B-OL Minn



Xylene

N3B-OL Minn



N3B-OL Minn



Xylene



Xylene



10% Xylene

15% Xylene

N3B-OL Minn



N3B-OL Minn



Xylene

Xylene

20% Xylene

25% Xylene

N3B-OL Minn



N3B-OL Minn



Xylene

Xylene

30% Xylene

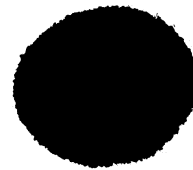
35% Xylene

N1A-L Mich



Skelly

N1A-L Mich



Xylene

N1A-L Mich



Xylene



10% Xylene

N1A-L Mich

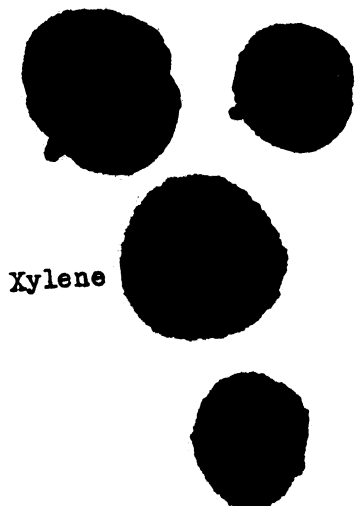


Xylene



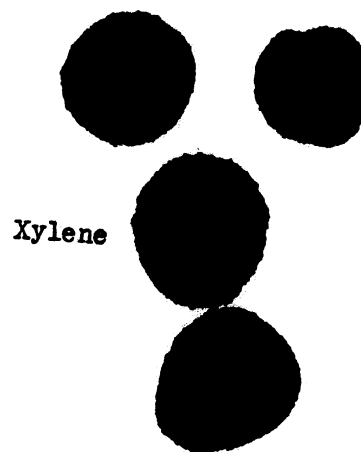
15% Xylene

NIA-L Mich



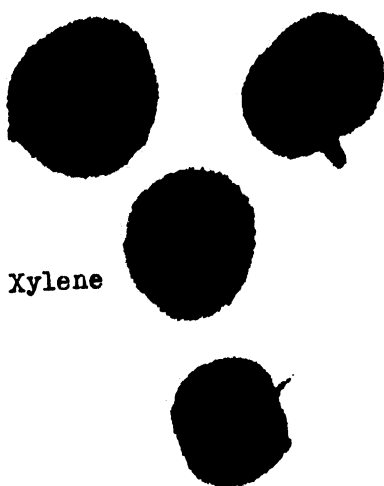
20% Xylene

NIA-L Mich



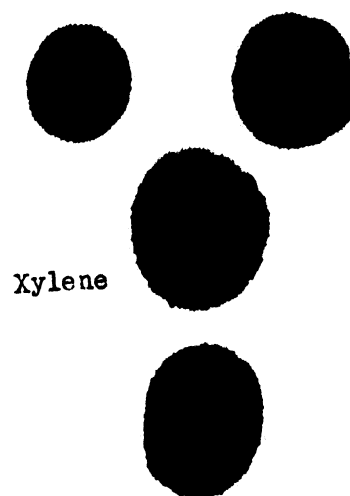
25% Xylene

NIA-L Mich



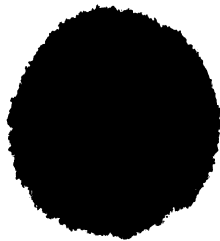
30% Xylene

NIA-L Mich



35% Xylene

N2A-L Mich



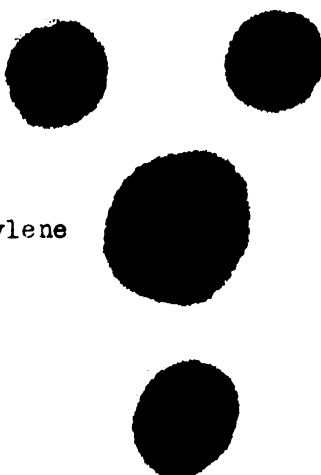
Skelly

N2A-L Mich



Xylene

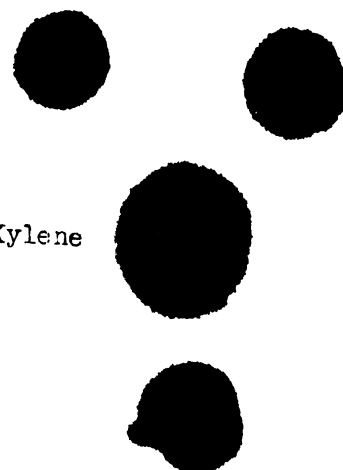
N2A-L Mich



Xylene

10% Xylene

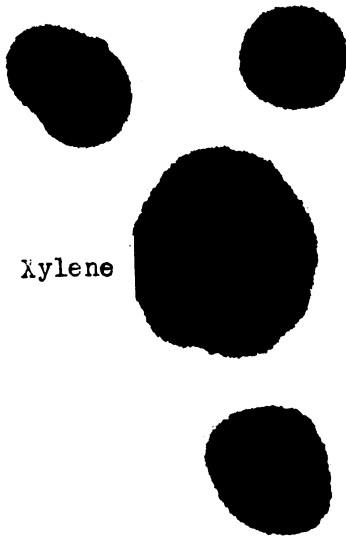
N2A-L Mich



Xylene

15% Xylene

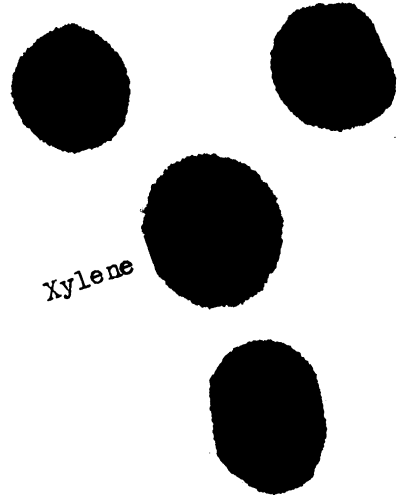
N2A-L Mich



Xylene

20% Xylene

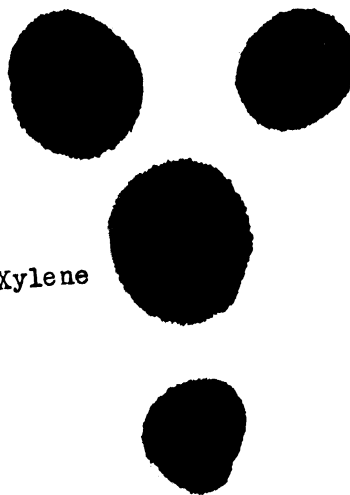
N2A-L Mich



Xylene

25% Xylene

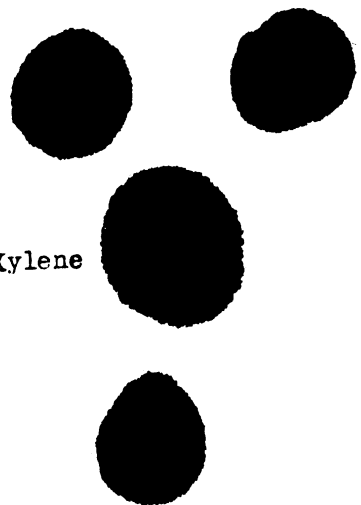
N2A-L Mich



Xylene

30% Xylene

N2A-L Mich



Xylene

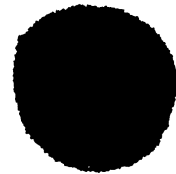
35% Xylene

N3A-L Mich



Skelly

N3A-L Mich



Xylene

N3A-L Mich



10% Xylene

N3A-L Mich

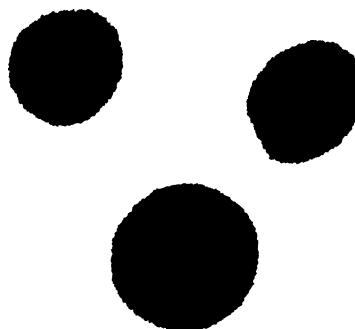


15% Xylene

N3A-L Mich



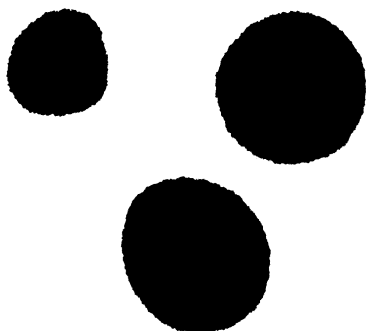
N3A-L Mich



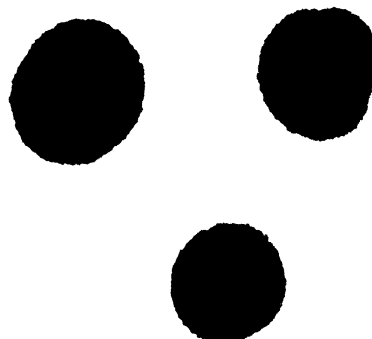
20% Xylene

25% Xylene

N3A-L Mich



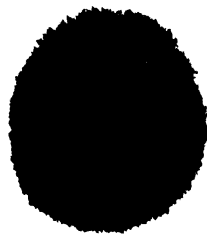
N3A-L Mich



30% Xylene

35% Xylene

N1B-L Mich



Skelly

N1B-L Mich



Xylene

N1B-L Mich



Xylene



10% Xylene



N1B-L Mich



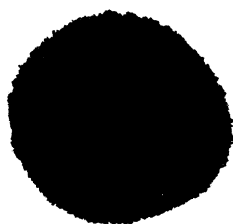
Xylene



15% Xylene



N2B-L Mich



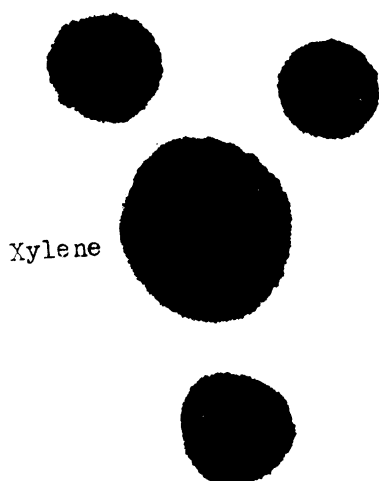
Skelly

N2B-L Mich



Xylene

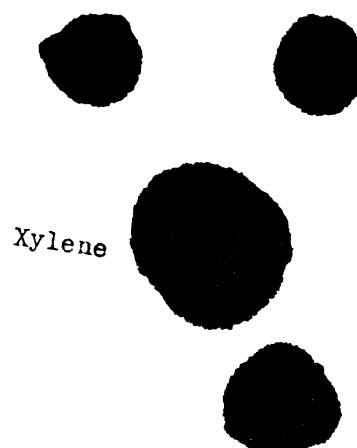
N2B-L Mich



Xylene

10% Xylene

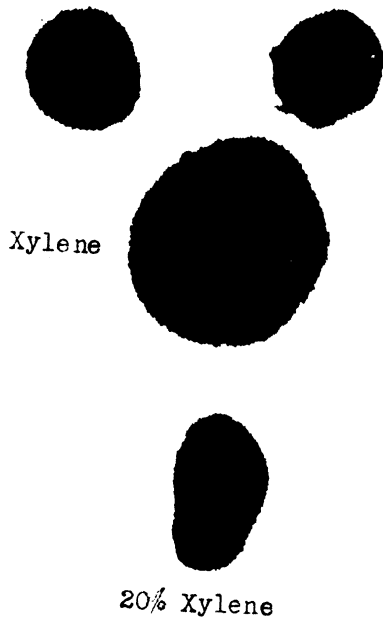
N2B-L Mich



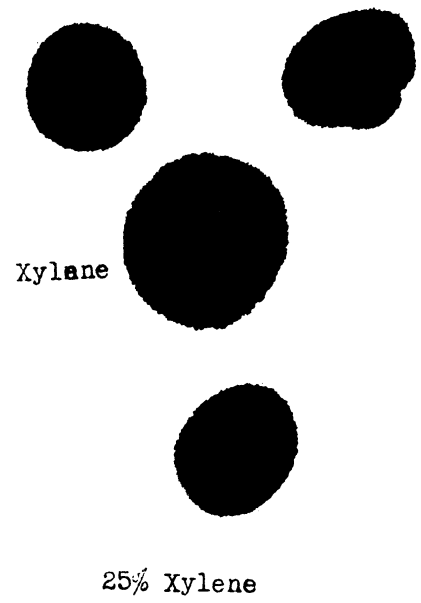
Xylene

15% Xylene

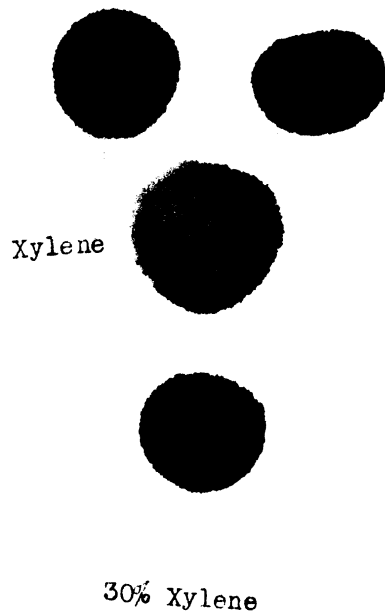
N2B-L Mich



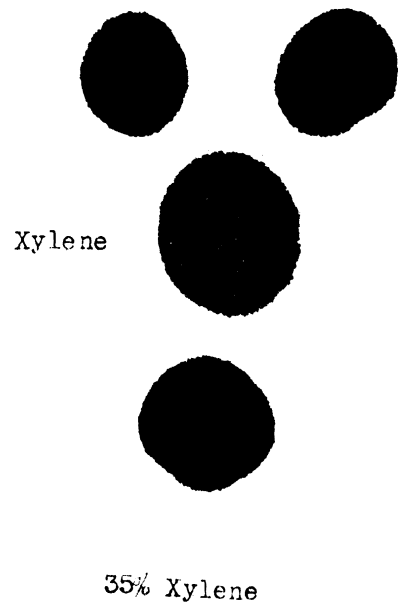
N2B-L Mich



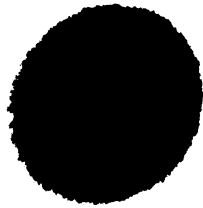
N2B-L Mich



N2B-L Mich

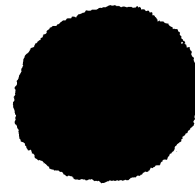


N3B-L Mich



Skelly

N3B-L Mich



Xylene

N3B-L Mich



10% Xylene

N3B-L Mich

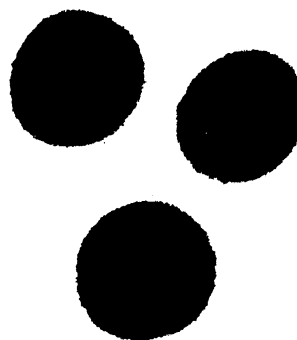


15% Xylene

N3B-L Mich



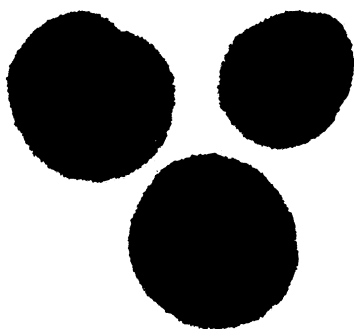
N3B-L Mich



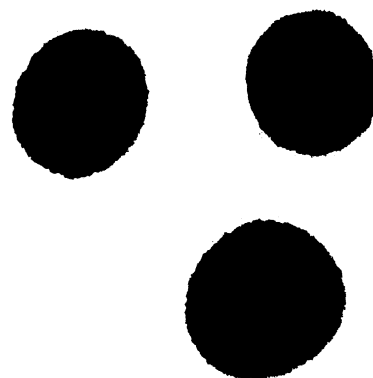
20% Xylene

25% Xylene

N3B-L Mich



N3B-L Mich



30% Xylene

35% Xylene

N1A-L Minn



Skelly

N1A-L Minn



Xylene

N1A-L Minn



10% Xylene

N1A-L Minn



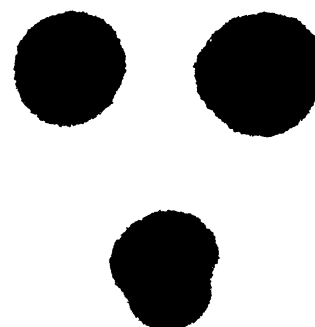
15% Xylene

NIA-L Minn



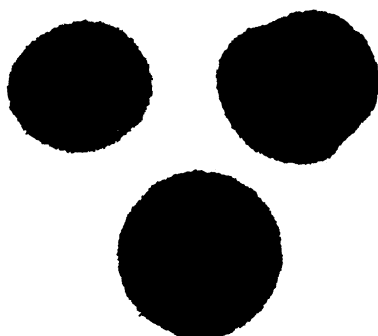
20% Xylene

NIA-L Minn



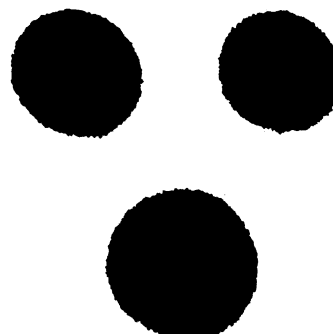
25% Xylene

NIA-L Minn



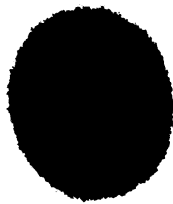
30% Xylene

NIA-L Minn



35% Xylene

N2A-L Minn



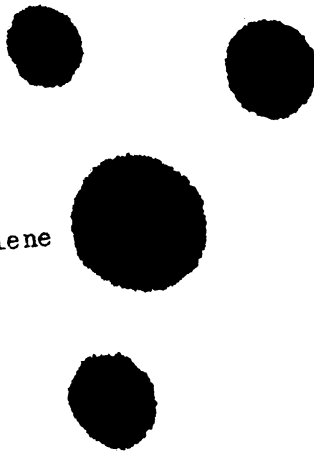
Skelly

N2A-L Minn



Xylene

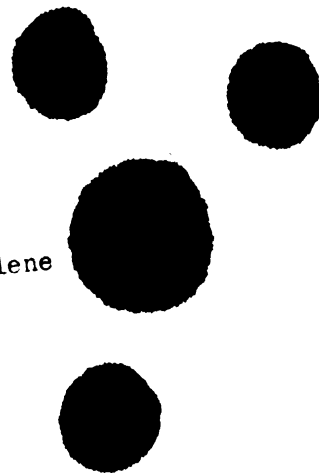
N2A-L Minn



Xylene

10% Xylene

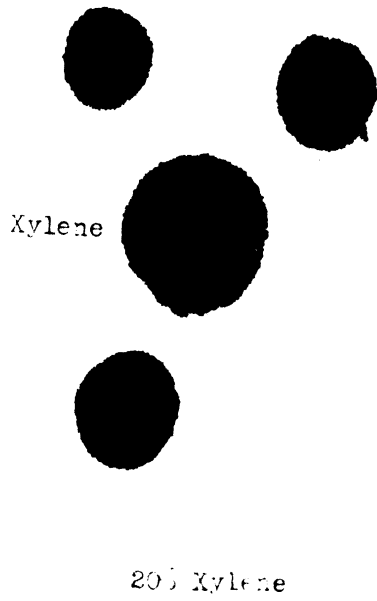
N2A-L Minn



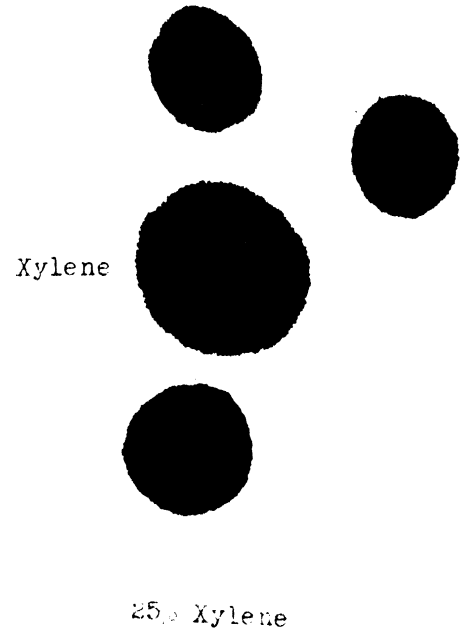
Xylene

15% Xylene

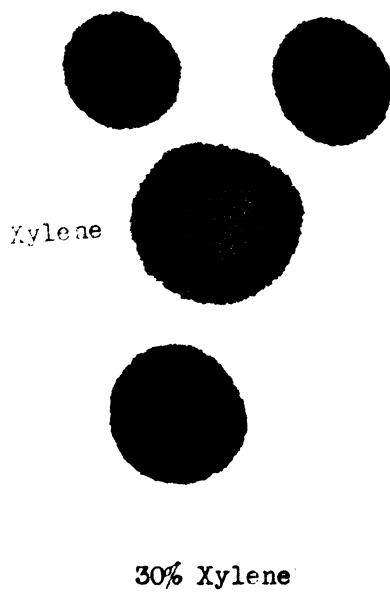
N2A-L Minn



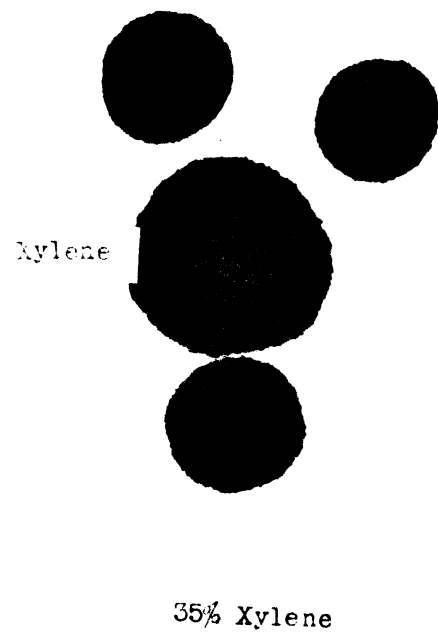
N2A-L Minn



N2A-L Minn



N2A-L Minn



N3A-L Minn



Skelly

N3A-L Minn



Xylene

N3A-L Minn



Xylene



10% Xylene

N3A-L Minn

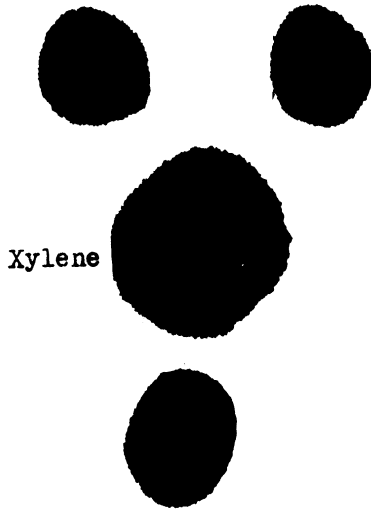


Xylene



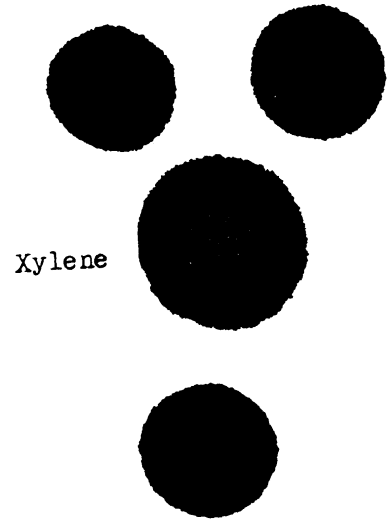
15% Xylene

N3A-L Minn



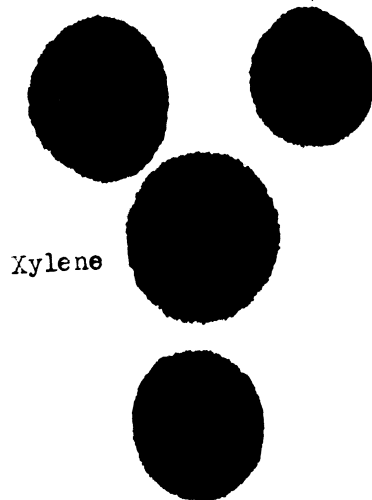
20% Xylene

N3A-L Minn



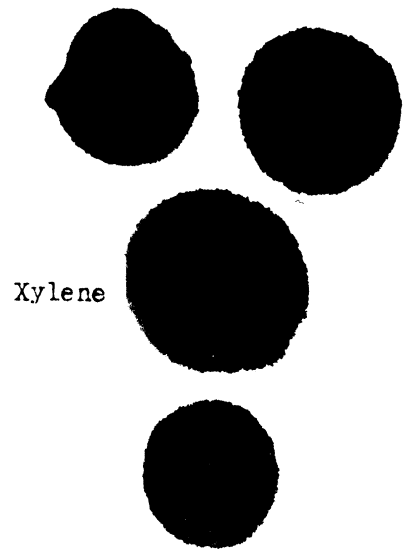
25% Xylene

N3A-L Minn



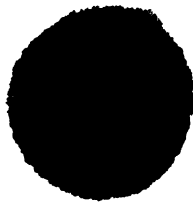
30% Xylene

N3A-L Minn



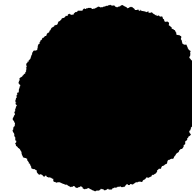
35% Xylene

N1B-L Minn



Skelly

N1B-L Minn



Xylene

N1B-L Minn



10% Xylene

N1B-L Minn



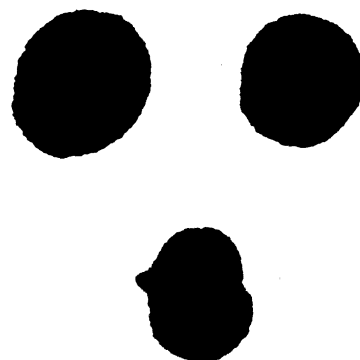
15% Xylene

N1B-L Minn



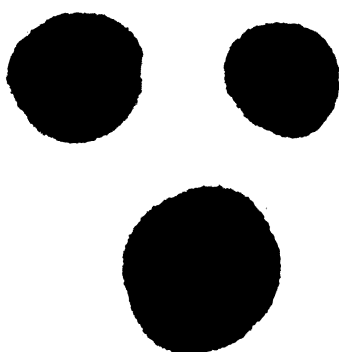
20% Xylene

N1B-L Minn



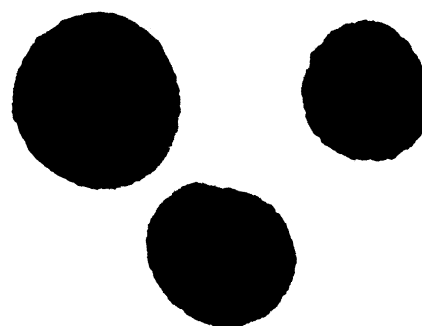
25% Xylene

N1B-L Minn



30% Xylene

N1B-L Minn



35% Xylene

N2B-L Minn



Skelly

N2B-L Minn



Xylene

N2B-L Minn



Xylene



10% Xylene

N2B-L Minn

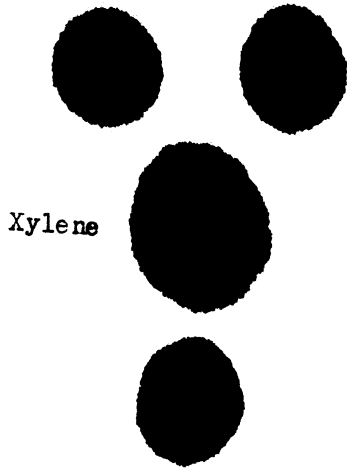


Xylene



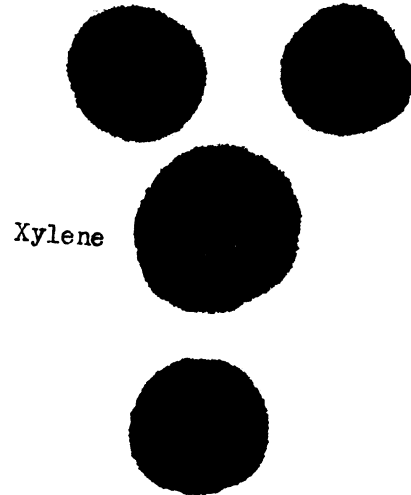
15% Xylene

N2B-L Minn



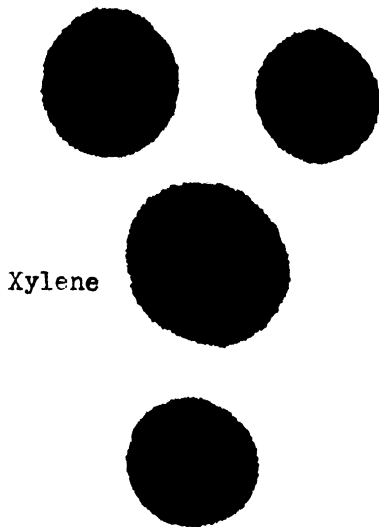
20% Xylene

N2B-L Minn



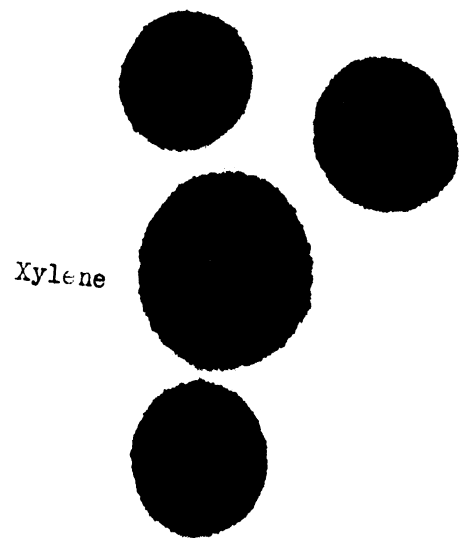
25% Xylene

N2B-L Minn



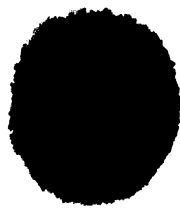
30% Xylene

N2B-L Minn



35% Xylene

N3B-L Minn



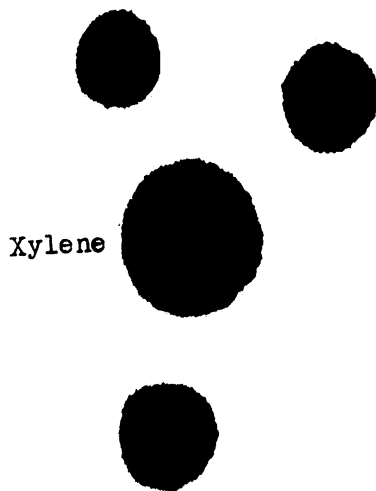
Skelly

N3B-L Minn



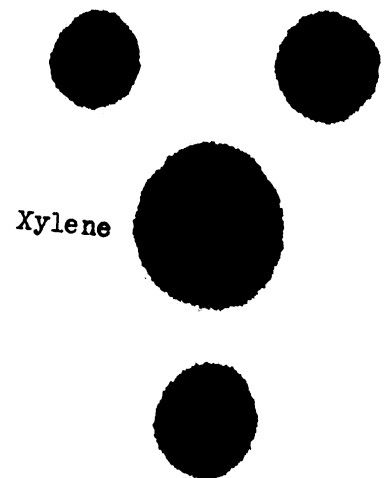
Xylene

N3B-L Minn



10% Xylene

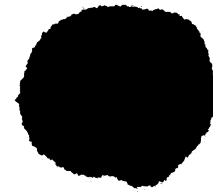
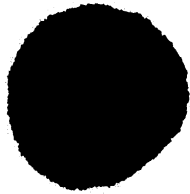
N3B-L Minn



15% Xylene

NIA-OT Mich

NIA-OT Mich



Skelly

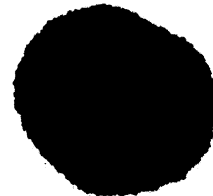
Xylene

NIA-OT Mich

NIA-OT Mich

Xylene

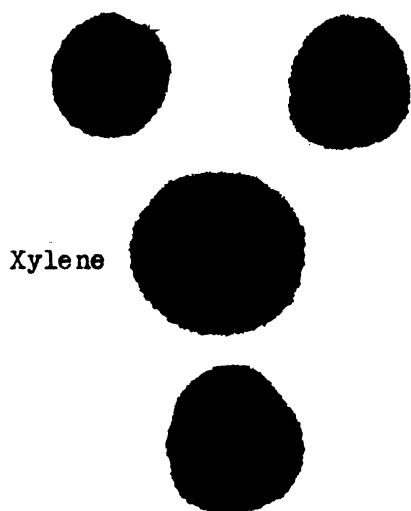
Xylene



10% Xylene

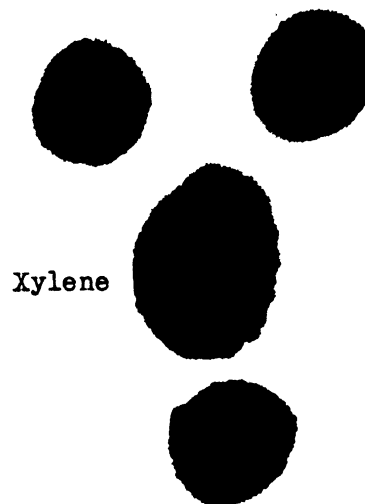
15% Xylene

N1A-OT Mich



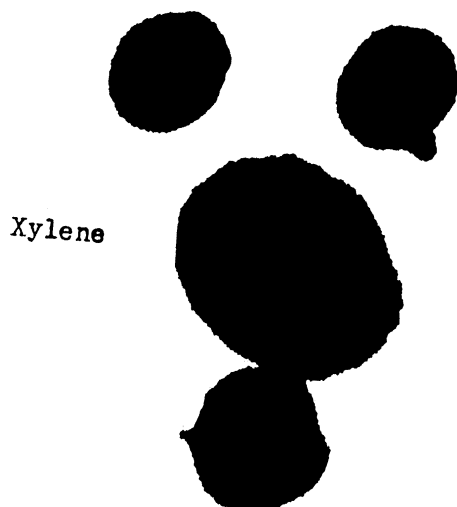
20% Xylene

N1A-OT Mich



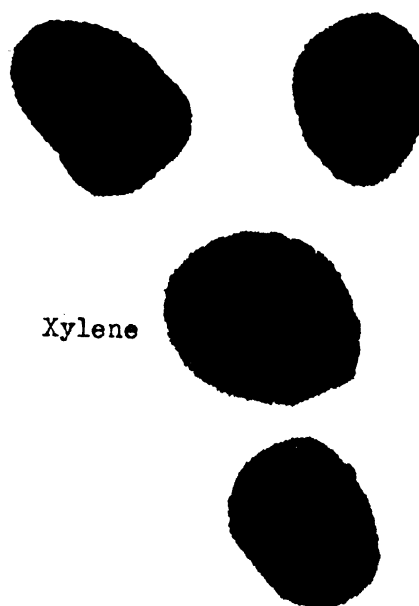
25% Xylene

N1A-OT Mich



30% Xylene

N1A-OT Mich



35% Xylene

N2A-OT Mich

N2A-OT Mich



Skelly

Xylene

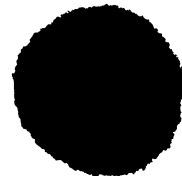
N2A-OT Mich

N2A-OT Mich



Xylene

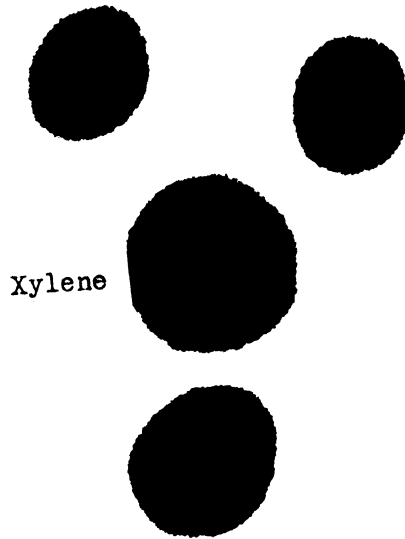
Xylene



10% Xylene

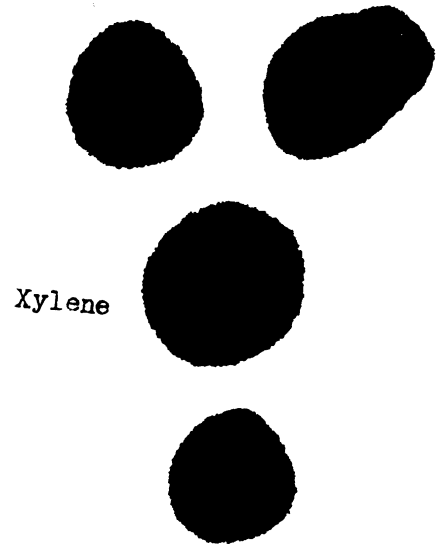
15% Xylene

N2A-OT Mich



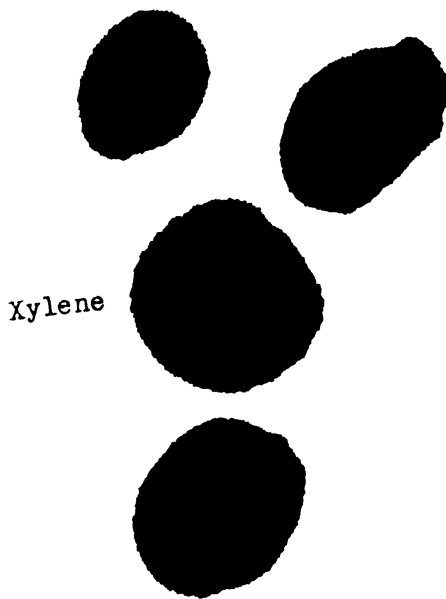
20% Xylene

N2A-OT Mich



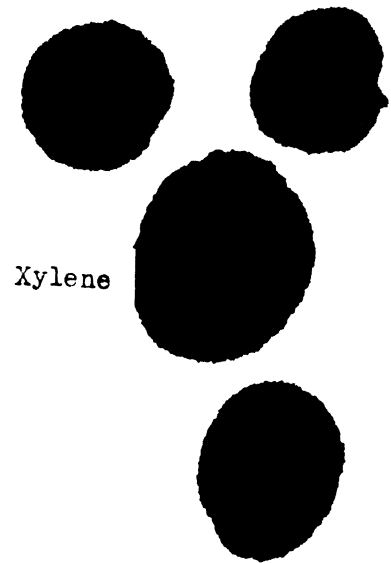
25% Xylene

N2A-OT Mich



30% Xylene

N2A-OT Mich



35% Xylene

N3A-OT Mich

N3A-OT Mich



Skelly

Xylene

N3A-OT Mich

N3A-OT Mich



Xylene

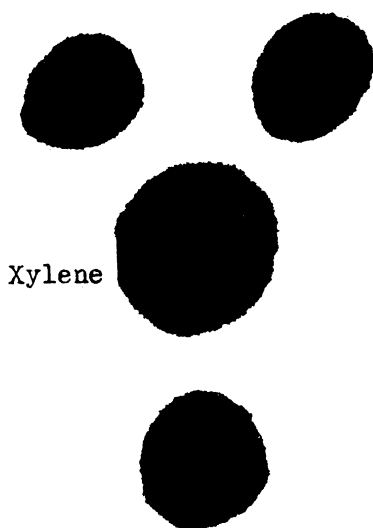
Xylene



10% Xylene

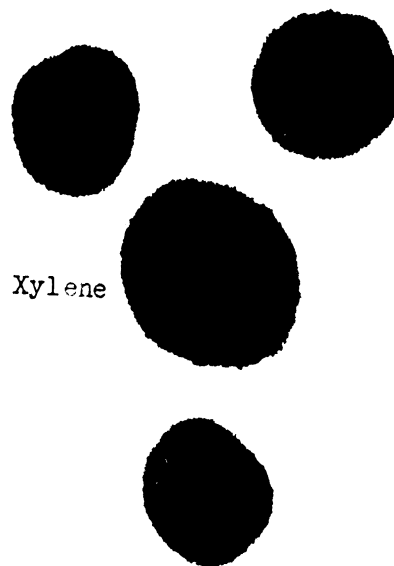
15% Xylene

N3A-OT Mich



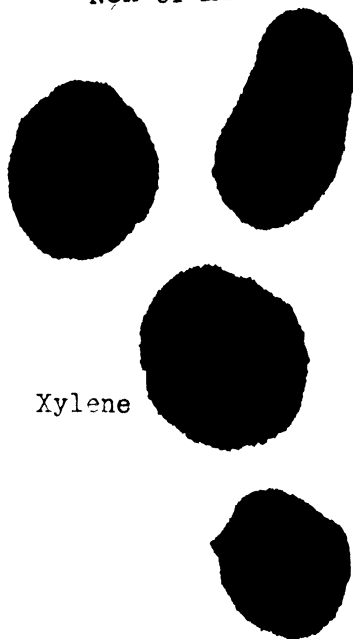
20% Xylene

N3A-OT Mich



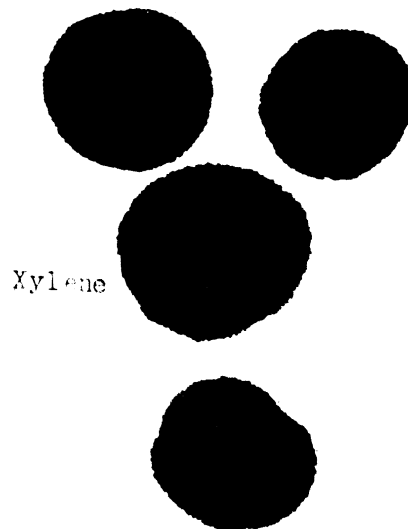
25% Xylene

N3A-OT Mich



30% Xylene

N3A-OT Mich



35% Xylene

N1B-OT Mich

N1B-OT Mich



Skelly

Xylene

N1B-OT Mich

N1B-OT Mich



Xylene

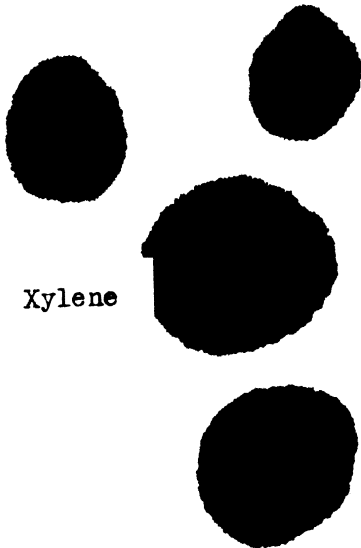
Xylene



10% Xylene

15% Xylene

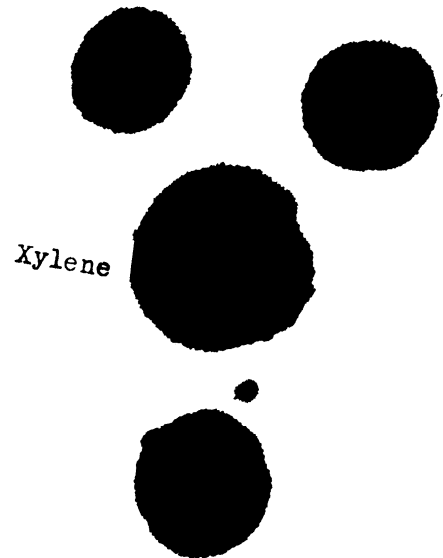
N1B-OT Mich



Xylene

20% Xylene

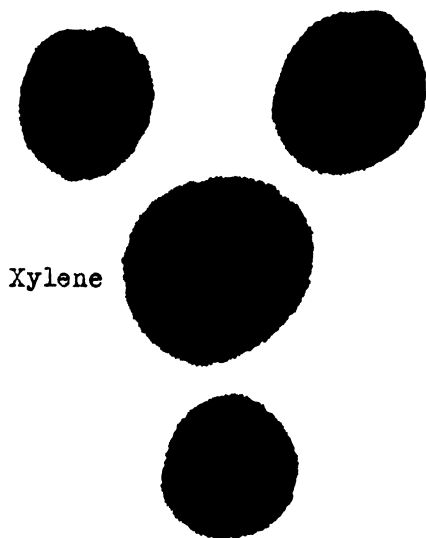
N1B-OT Mich



Xylene

25% Xylene

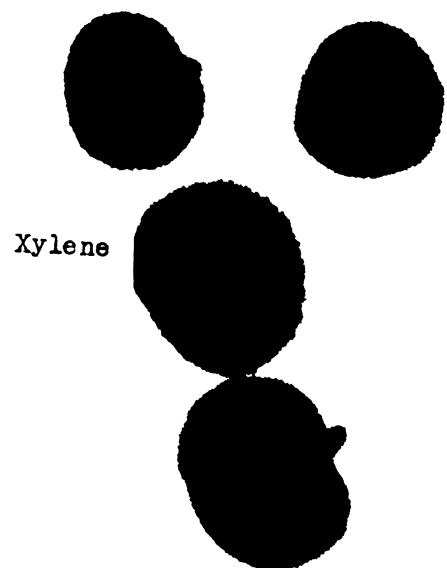
N1B-OT Mich



Xylene

30% Xylene

N1B-OT Mich

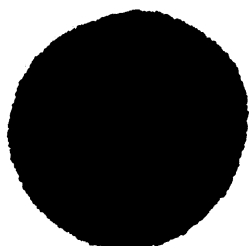


Xylene

35% Xylene

N2B-OT Mich

N2B-OT Mich

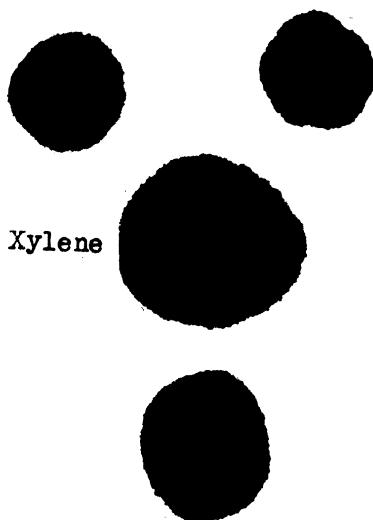


Skelly

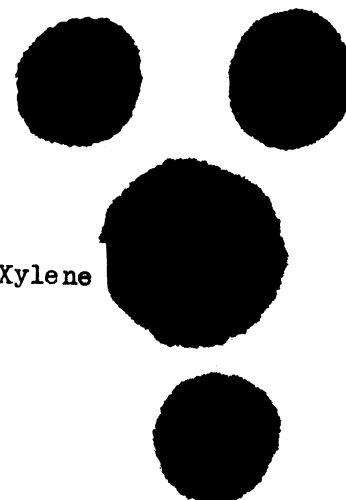
Xylene

N2B-OT Mich

N2B-OT Mich



Xylene

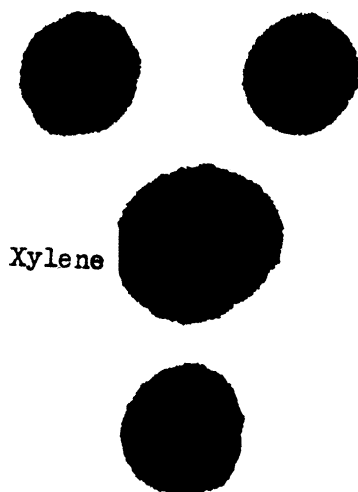


Xylene

10% Xylene

15% Xylene

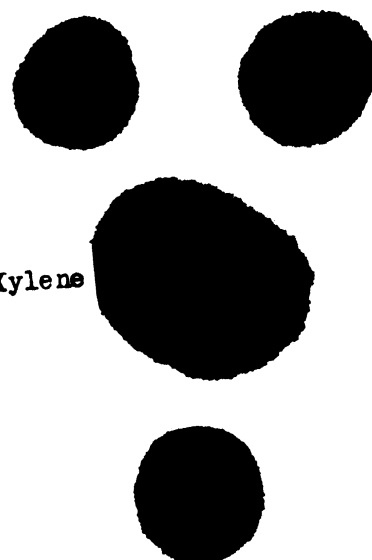
N2B-OT Mich



Xylene

20% Xylene

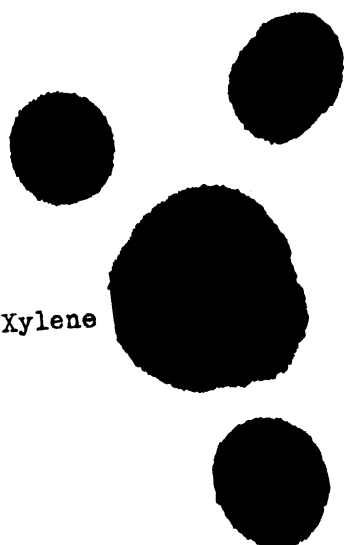
N2B-OT Mich



Xylene

25% Xylene

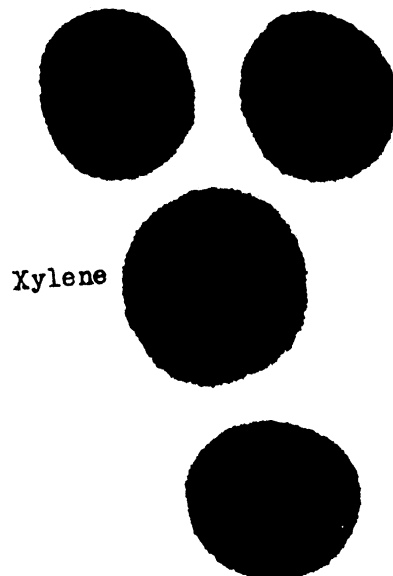
N2B-OT Mich



Xylene

30% Xylene

N2B-OT Mich



Xylene

35% Xylene

N3B-OT Mich

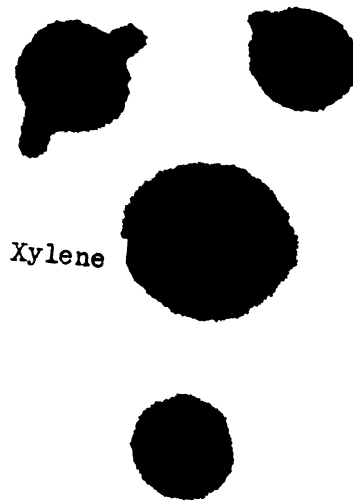
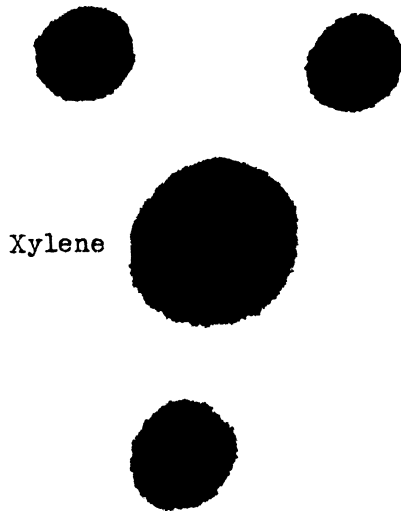
N3B-OT Mich

Skelly

Xylene

N3B-OT Mich

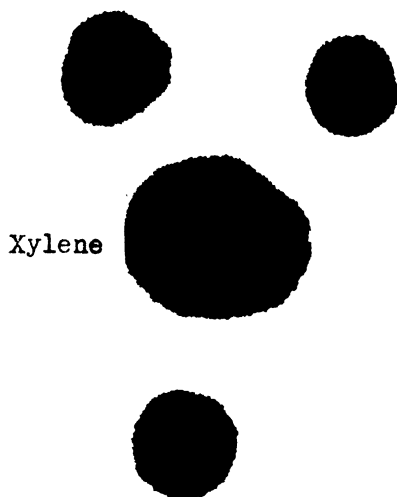
N3B-OT Mich



10% Xylene

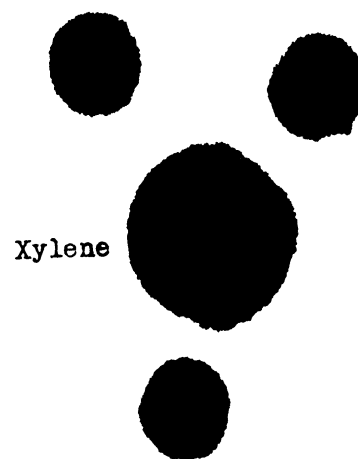
15% Xylene

N3B-OT Mich



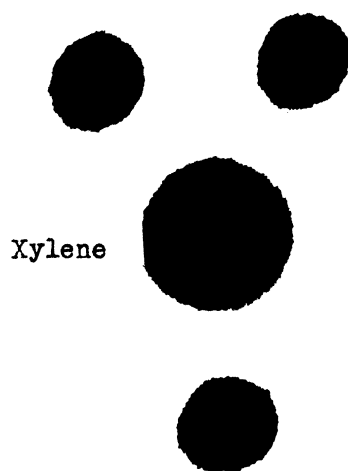
20% Xylene

N3B-OT Mich



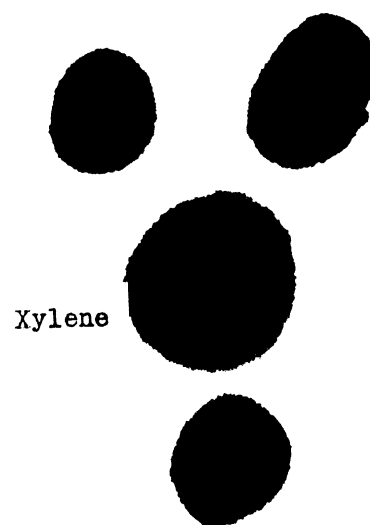
25% Xylene

N3B-OT Mich



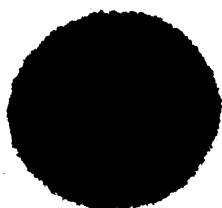
30% Xylene

N3B-OT Mich



35% Xylene

NIA-OT Minn



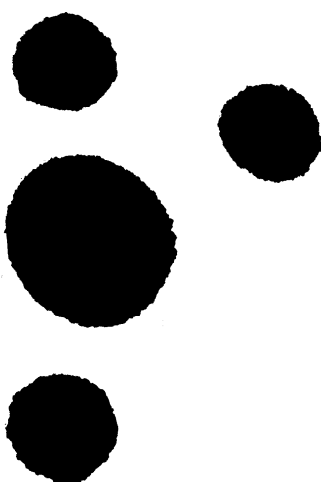
Skelly

NIA-OT Minn



Xylene

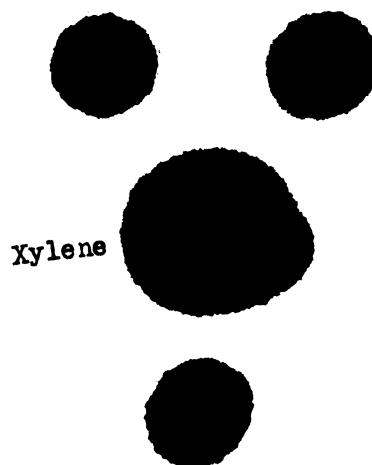
NIA-OT Minn



Xylene

10% Xylene

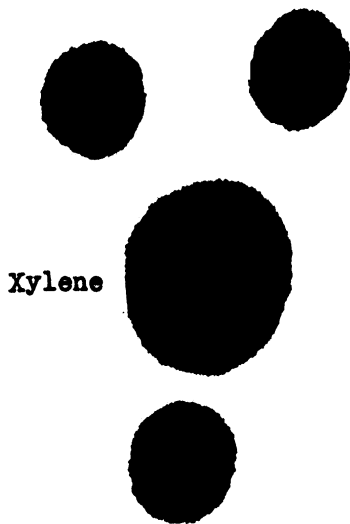
NIA-OT Minn



Xylene

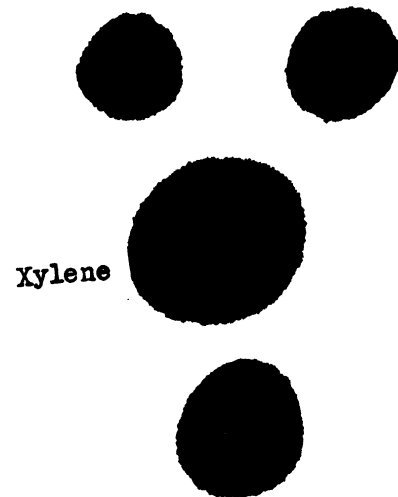
15% Xylene

NIA-OT Minn



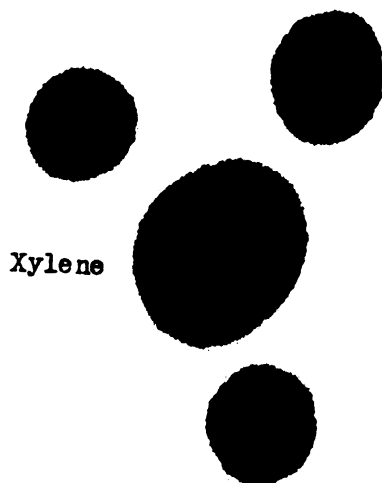
20% Xylene

NIA-OT Minn



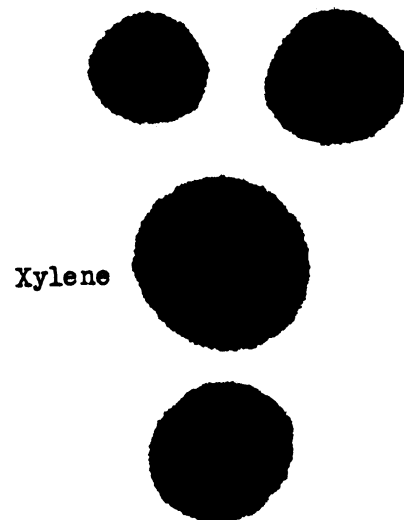
25% Xylene

NIA-OT Minn



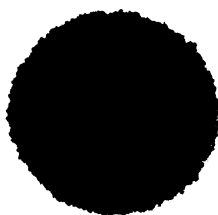
30% Xylene

NIA-OT Minn



35% Xylene

N2A-OT Minn



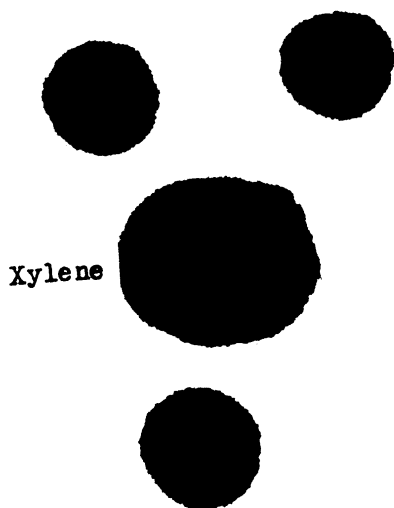
Skelly

N2A-OT Minn



Xylene

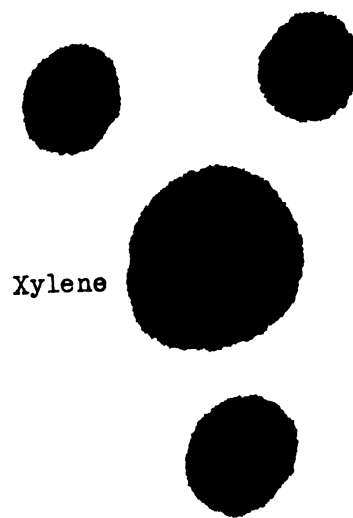
N2A-OT Minn



Xylene

10% Xylene

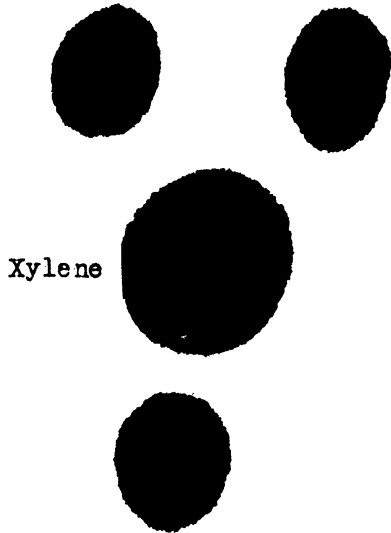
N2A-OT Minn



Xylene

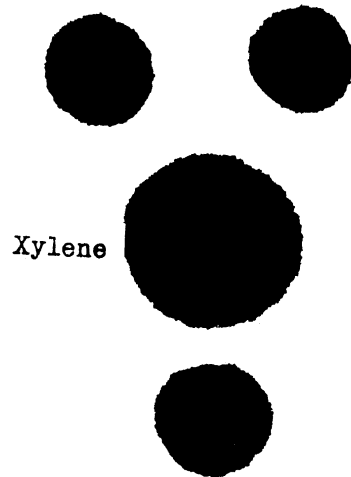
15% Xylene

N2A-OT Minn



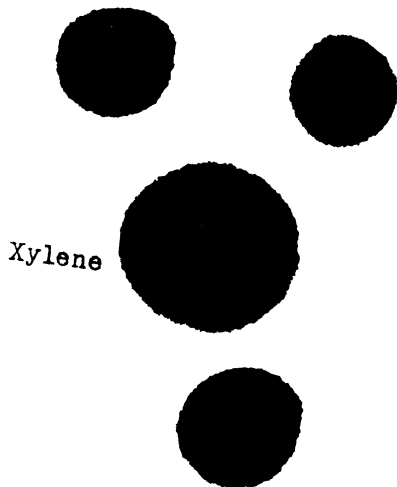
20% Xylene

N2A-OT Minn



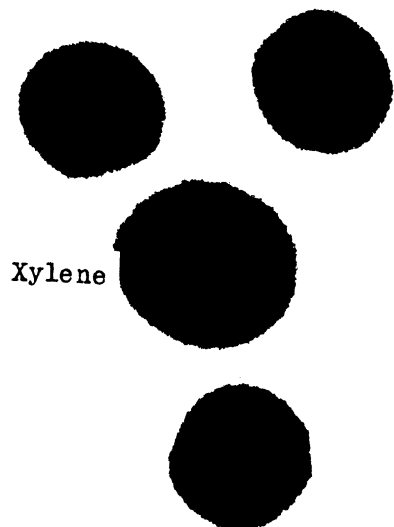
25% Xylene

N2A-OT Minn



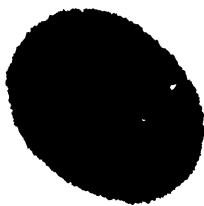
30% Xylene

N2A-OT Minn



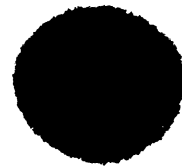
35% Xylene

N3A-OT Minn



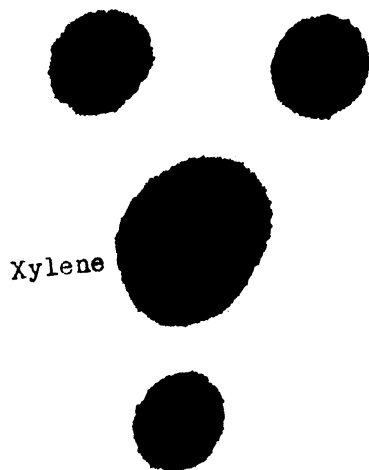
Skelly

N3A-OT Minn



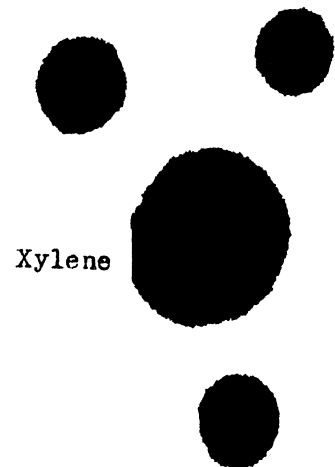
Xylene

N3A-OT Minn



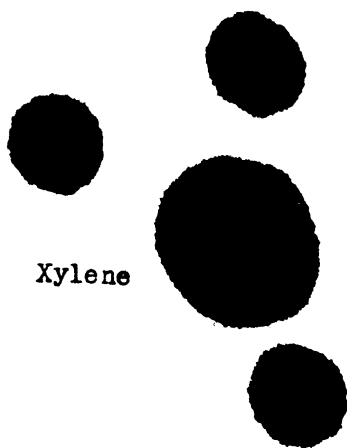
10% Xylene

N3A-OT Minn



15% Xylene

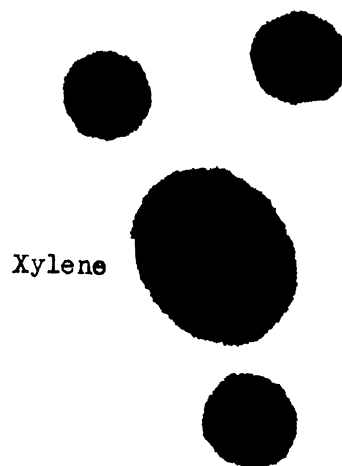
N3A-OT Minn



Xylene

20% Xylene

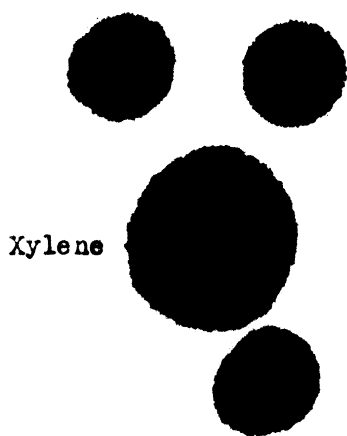
N3A-OT Minn



Xylene

25% Xylene

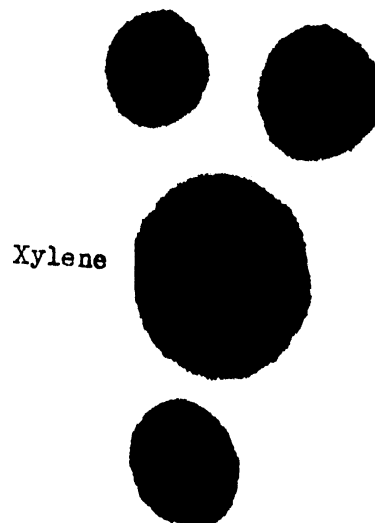
N3A-OT Minn



Xylene

30% Xylene

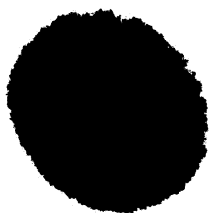
N3A-OT Minn



Xylene

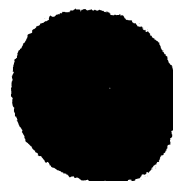
35% Xylene

N1B-OT Minn



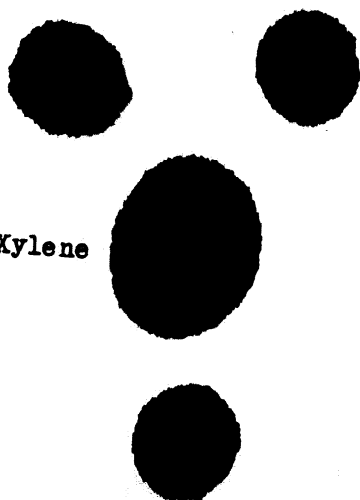
Skelly

N1B-OT Minn



Xylene

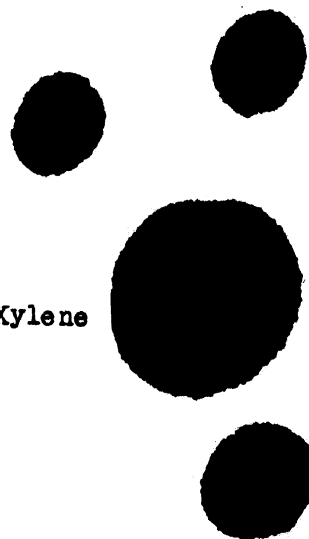
N1B-OT Minn



Xylene

10% Xylene

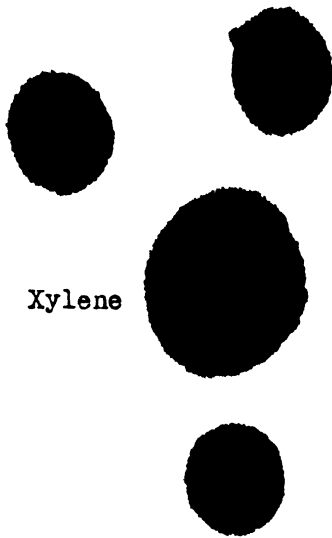
N1B-OT Minn



Xylene

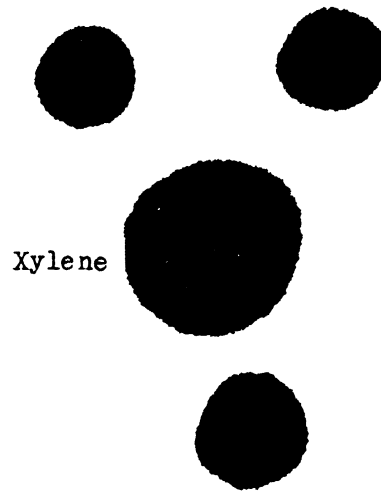
15% Xylene

N1B-OT Minn



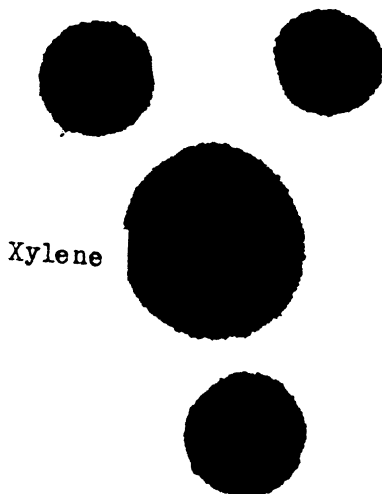
20% Xylene

N1B-OT Minn



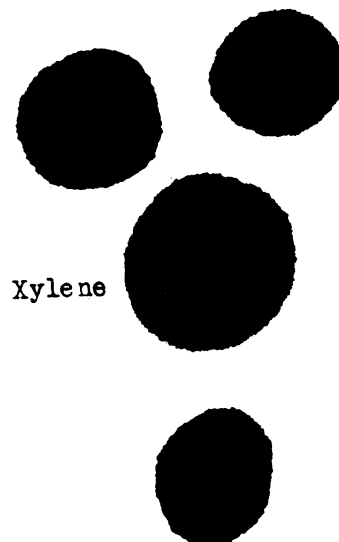
25% Xylene

N1B-OT Minn



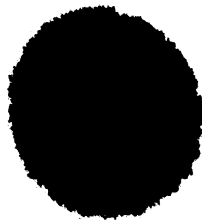
30% Xylene

N1B-OT Minn



35% Xylene

N2B-OT Minn



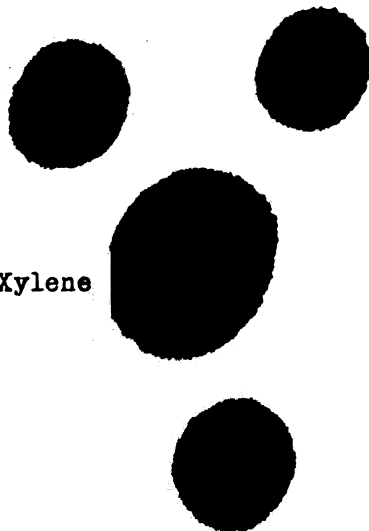
Skelly

N2B-OT Minn



Xylene

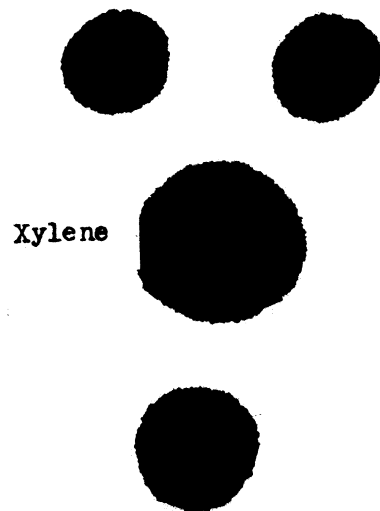
N2B-OT Minn



Xylene

10% Xylene

N2B-OT Minn



Xylene

15% Xylene

N3B-OT Minn



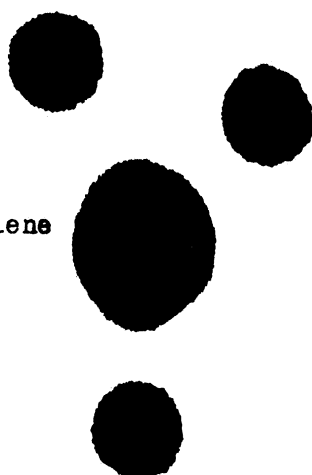
Skelly

N3B-OT Minn



Xylene

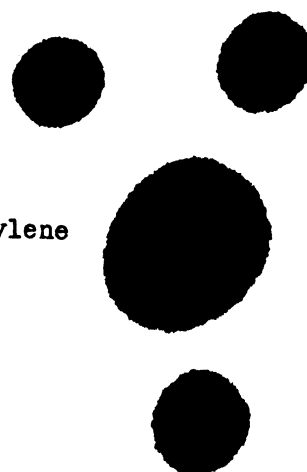
N3B-OT Minn



Xylene

10% Xylene

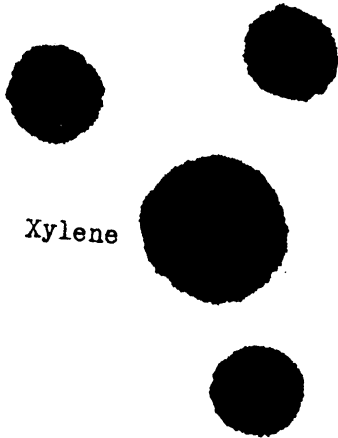
N3B-OT Minn



Xylene

15% Xylene

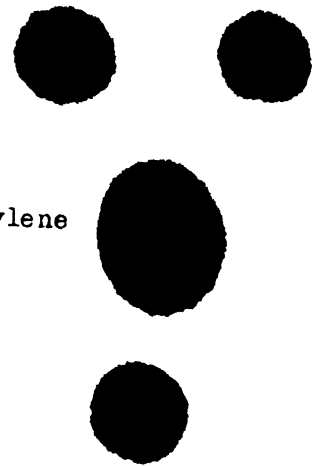
N3B-OT Minn



Xylene

20% Xylene

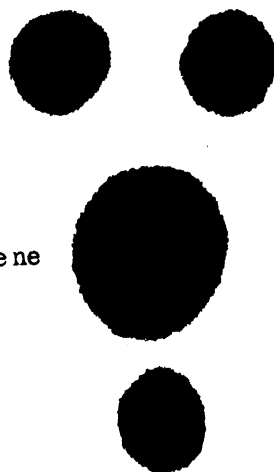
N3B-OT Minn



Xylene

25% Xylene

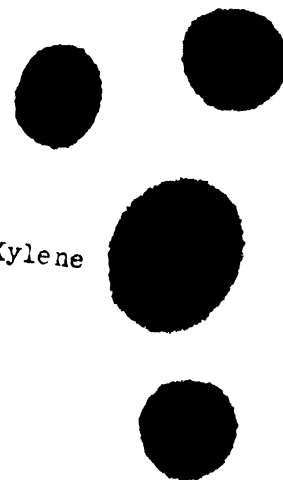
N3B-OT Minn



Xylene

30% Xylene

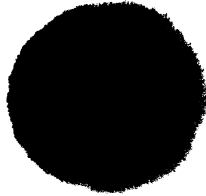
N3B-OT Minn



Xylene

35% Xylene

OL- Leonard Asphalt
Original Material
Tested 1/28/57



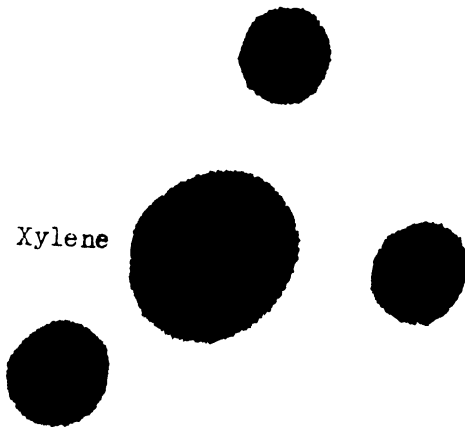
Skelly

OL- Leonard Asphalt
Original Material
Tested 1/28/57



Straight Xylene

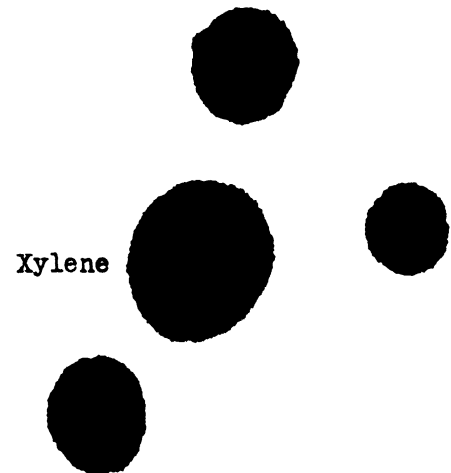
OL- Leonard Asphalt
Original Material
Tested 1/28/57



Xylene

10% Xylene-90% Heptane

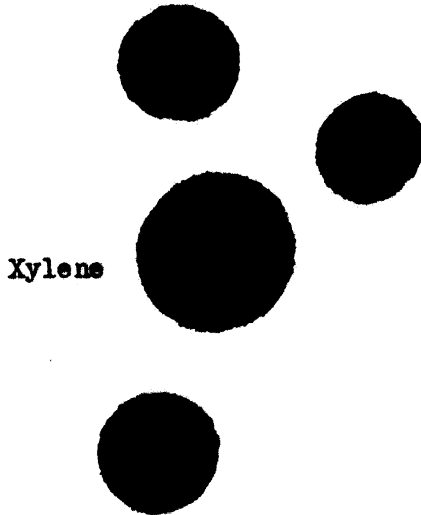
OL- Leonard Asphalt
Original Material
Tested 1/28/57



Xylene

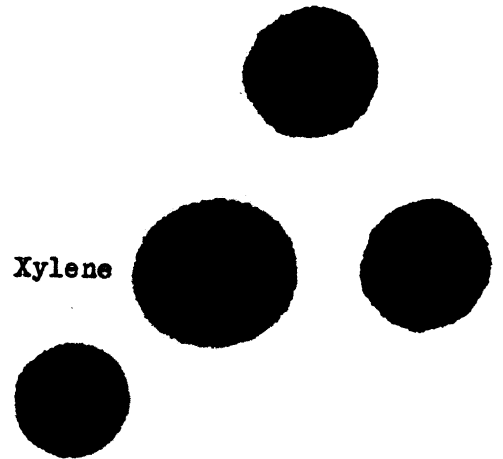
15% Xylene-85% Heptane

OL- Leonard Asphalt
Original Material
Tested 1/28/57



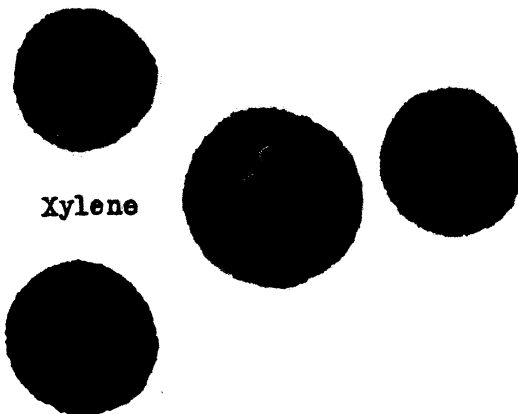
20% Xylene-80% Heptane

OL- Leonard Asphalt
Original Material
Tested 1/28/57



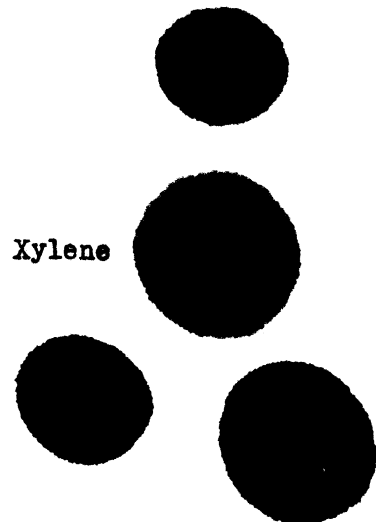
25% Xylene-75% Heptane

OL- Leonard Asphalt
Original Material
Tested 1/28/57



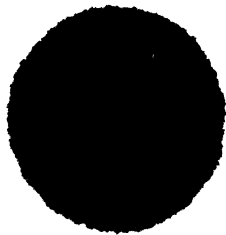
30% Xylene-70% Heptane

OL- Leonard Asphalt
Original Material
Tested 1/28/57



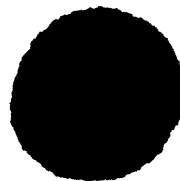
35% Xylene-65% Heptane

L- Lion Asphalt
Original Material
Tested 1/28/57



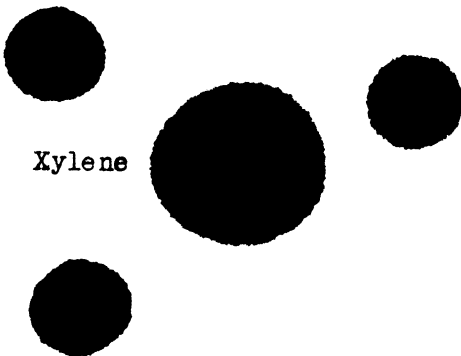
Skelly

Lion Asphalt
Original Material
Tested 1/28/57



Straight Xylene

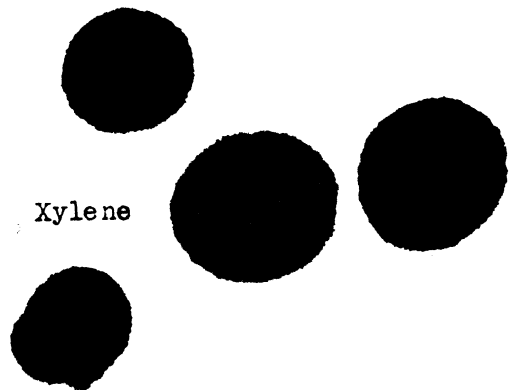
L- Lion Asphalt
Original Material
Tested 1/28/57



Xylene

10% Xylene-90% Heptane

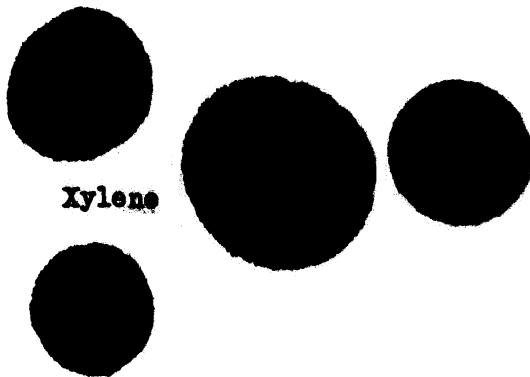
L- Lion Asphalt
Original Material
Tested 1/28/57



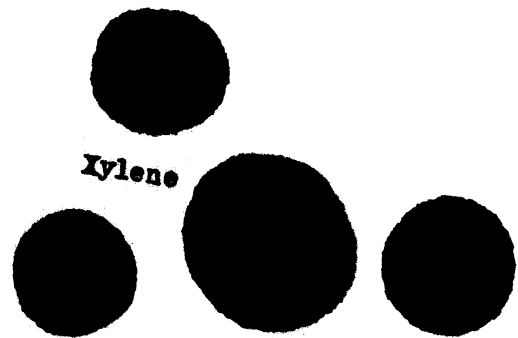
Xylene

15% Xylene-85% Heptane

L- Lion Asphalt
Original Material
Tested 1/28/57



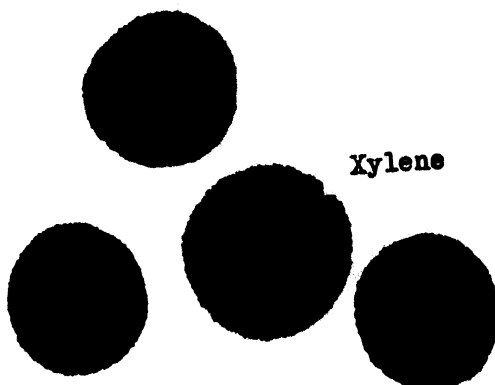
L- Lion Asphalt
Original Material
Tested 1/28/57



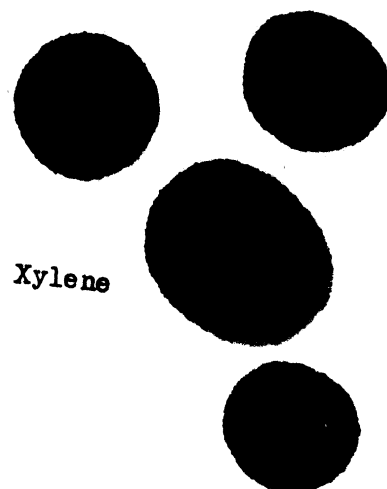
20% Xylene-80% Heptane

25% Xylene-75% Heptane

L- Lion Asphalt
Original Material
Tested 1/28/57



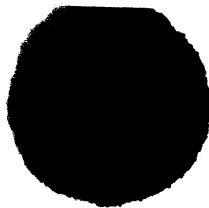
L- Lion Asphalt
Original Material
Tested 1/28/57



30% Xylene-70% Heptane

35% Xylene-65% Heptane

OT-Trumbull Asphalt
Original Material
Tested 1/28/57



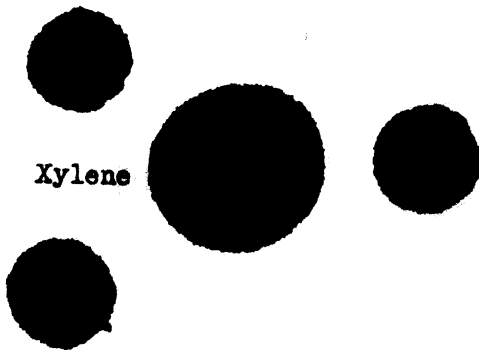
Skelly

OT-Trumbull Asphalt
Original Material
Tested 1/28/57



Straight Xylene

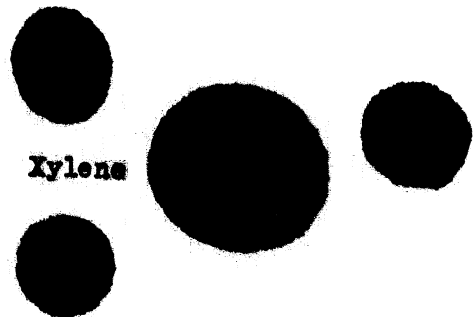
OT- Trumbull Asphalt
Original Material
Tested 1/28/57



Xylene

10% Xylene-90% Heptane

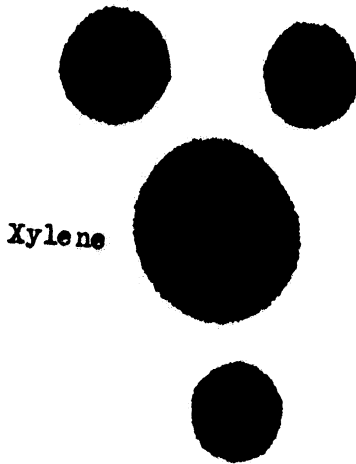
OT-Trumbull Asphalt
Original Material
Tested 1/28/57



Xylene

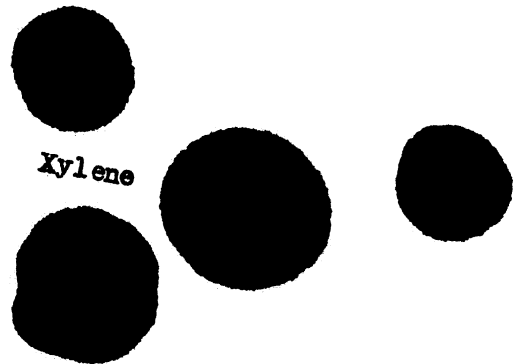
15% Xylene-85% Heptane

OT-Trumbull Asphalt
Original Material
Tested 1/28/57



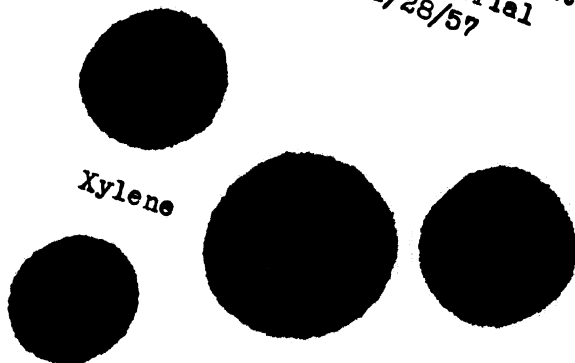
20% Xylene-80% Heptane

OT-Trumbull Asphalt
Original Material
Tested 1/28/57



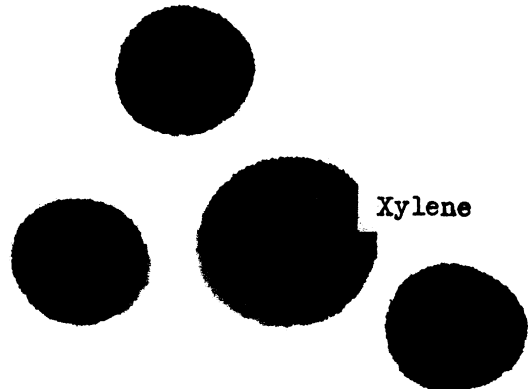
25% Xylene-75% Heptane

OT-Trumbull Asphalt
Original Material
Tested 1/28/57



30% Xylene-70% Heptane

OT-Trumbull Asphalt
Original Material
Tested 1/28/57



35% Xylene-65% Heptane

