

MIXED ISOMERIC TERPHENYLS

Technical Bulletin No. P-105

April 25, 1949

Monsanto Chemical Company
St. Louis 4, Mo.



Mixed Isomeric Terphenyls are high melting hydrocarbons of unusual stability toward heat. There is no detectable action on the Mixed Isomeric Terphenyl from boiling 10% H_2SO_4 or boiling 10% NaOH.

Physical Properties

Density @ 25°C. - g./cc. 1.133
Color - NPA 3.5 - 4.5

Melting Point

Mixed Isomeric Terphenyl does not have a sharp melting point.

Begins to soften 60°C. (140°F.)
Completely liquid 145°C. (293°F.)

Solidification Temp.

Upper hold point 137-145°C. (278-293°F.)
Lower hold point 48-63°C. (118-145°F.)

Distillation Range D-20 modified. 364-418°C. (687-784°F.)

Flash point 191°C. (375°F.)
Flame point 238°C. (460°F.)

The information in this bulletin is based on our experience, represents our best judgment in the matter, and is intended to be helpful; but we cannot assume responsibility for any loss or accident that may result from its use.

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Vapor Pressure - Mm of Mercury

<u>T. °C.</u>	<u>Mm. Hg.</u>	<u>T. °C.</u>	<u>Mm. Hg.</u>	<u>T. °C.</u>	<u>Mm. Hg.</u>
150	1.3	230	26	310	220
160	2.0	240	36	320	270
170	3.0	250	48	330	340
180	4.6	260	63	340	410
190	6.8	270	83	350	500
200	9.8	280	110	360	610
210	14.0	290	140	370	730
220	19.0	300	180	380	870

Electrical Properties

Dielectric Constant		2.58
Volume Resistivity - ohm-cm	100°C.	140,000 x 10 ⁹
	135°C.	35,000 x 10 ⁹
	155°C.	550 x 10 ⁹

Comparative Hardness

(Smaller figure denoting greater hardness)

Average Penetration in
cm. x 10² in 60 seconds
at 25°C. under load indi-
cated. ASTM D-5-25.

<u>Wax</u>	<u>Load - - -</u>	<u>50 grs.</u>	<u>150 grs.</u>	<u>250 grs.</u>
Meta Terphenyl		0	0	2.3
Para Terphenyl		0	0	3.3
Carnauba Wax		0	2.3	4.7
Candelilla Wax		0	3.3	4.7
Ortho Terphenyl		1.3	4.0	10.7
50% Paraffin & 50% Meta Terphenyl		3.7	12.3	18.0
75% Paraffin & 25% Meta Terphenyl		7.3	18.0	25.3
Ceresine Wax		9.3	15.7	26.0
95% Paraffin & 5% Meta Terphenyl		10.7	21.0	29.7
98% Paraffin & 2% Meta Terphenyl		11.7	26.0	32.7
Paraffin Wax		14.3	23.3	31.3
Montan Wax		15.0	28.7	37.3
Mixed Isomeric Terphenyl:				
Aged 24 hours		28.7	--	--
Unaged		60.0	--	--

PENETRATION TESTS (A.S.T.M.-D-5-25) ON

MIXTURES OF MIXED ISOMERIC TERPHENYL AND SOFT PARAFFIN

Composition of Mixture		Approx. Temp. For 1st Crystals	Apparent Segregation	Penetration Cm x 10 ² in 60 sec. @ 25°C.		
				50 g.	150 g.	250 g.
% Mixed Iso.Ter.	% Paraffin					
100	0	143	Yes	*38 # 8	80	161
75	25	140	No	11	21	28
50	50	135	No	17	27	43
25	75	120	No	26	42	56
0	100	52	No	16	58	109
					42	53

* Soft Portion

Hard Portion

Solubility

Solvent	Grs. Mixed Isomeric Terphenyl per 100 ml. of solvent	
	25°C.	75°C.
3A Alcohol	0.008	0.6
Turpentine	1.2	9.0
Fuel Oil, API 36° SUS 100°F.-38	1.66	8.4
Benzene	6.0	42.0
Trichlorobenzene	9.0	45.0
Stoddard's Solvent	0.7	8.0
Nitromethane	0.2	7.5
Nitroethane	2.0	15.0
1-Nitropropane	2.0	20.0
2-Nitropropane	2.0	20.0

(See graphs of solubilities attached.)

Solubility - 20% Solution of
Mixed Isomeric Terphenyl

<u>Solvent</u>	<u>Minimum Temp. °C. for complete solution (20 gms. Mixed Isomeric Terphenyl and 80 gms. solvent)</u>
Tetrachloroethane	53
Dioxane	58
Orthodichlorobenzene	58
Benzoyl chloride	60
Monochlorobenzene	60
Trichlorobenzene (mixed isomers) ..	60
Benzyl Chloride	62
Benzene	64
Trichloroethylene	64
Pyridine	66
Chloronaphthalene	72
Furfural	72
Xylene	72
Bromonaphthalene	73
Diphenyloxide	76

Coefficients of Thermal Expansion of Mixed Isomeric Terphenyl

<u>Temp. Range</u>	<u>Coefficient of Cubical Expansion Vol./unit vol./deg. C.</u>	<u>Coefficient of Linear Expansion Length/unit length/deg. C.</u>
25-60°C.	8.3×10^{-4}	2.8×10^{-4}
60-77°C.	11.5×10^{-4}	3.8×10^{-4}
25-77°C.	9.4×10^{-4}	3.1×10^{-4}

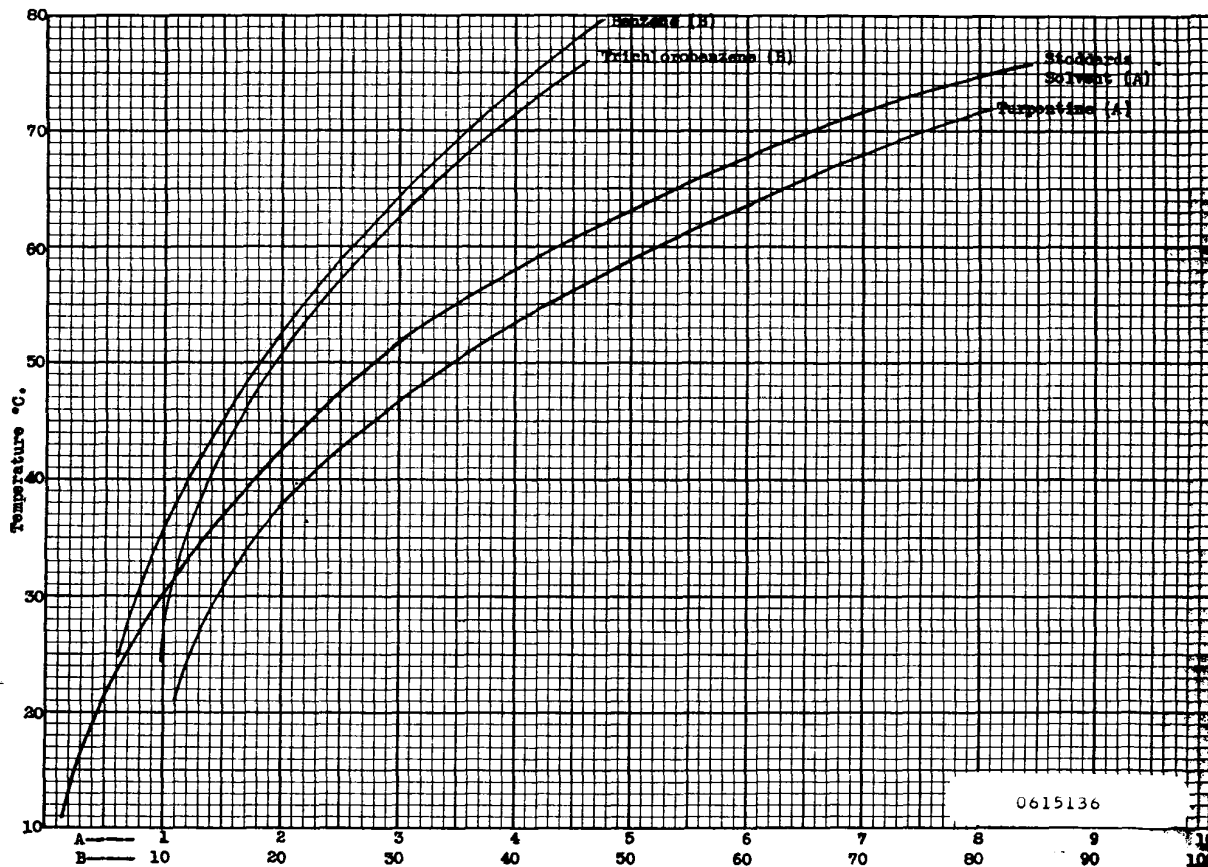
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MONSANTO CHEMICAL COMPANY
St. Louis 4, Mo.

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SOLUBILITY OF MIXED ISOMERIC TERPHENYL



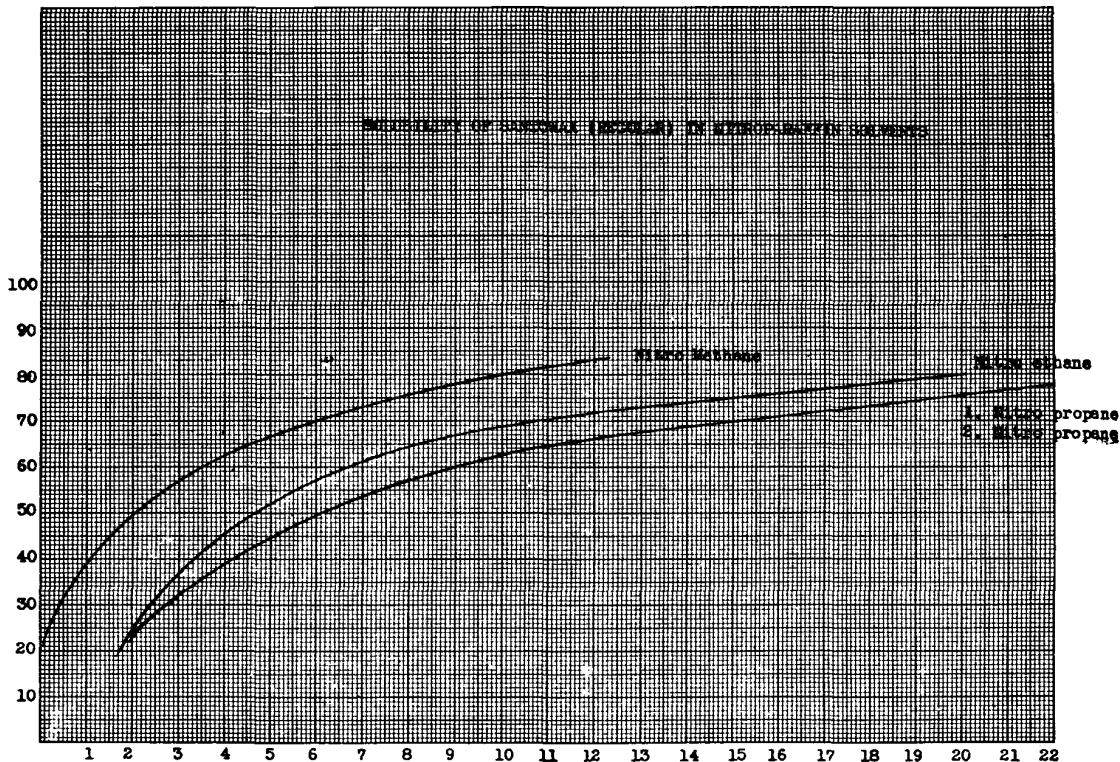
COOK BOOK COMPANY, INC. NEWTON, MASSACHUSETTS, U.S.A.



Grams of Mixed Isomeric Terphenyl per 100 cc of Solvent

NOT FOR PUBLICATION

Temperature °C.



Grams per 100 cc. of solvent

0615137

COOK BOOK COMPANY, INC., NEWBURY, MASSACHUSETTS



NO. 218, MILLIMETERS, 160 BY 220 DIVISIONS.

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