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MONSANTO CHEMICALS

MIXED ISOMERIC TERPHENYLS

Technical Bulletin No. P-105
April 25, 1949
Monsanto Chemical Company
St. Louis 4, Mo.

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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.

0615132

TOWOLDMON0039204
WATER_PCB-00023673

Vapor Pressure - Mm of Mercury

T. °C.	Mm. Hg.	T. °C.	Mm. Hg.	T. °C.	Mm. Hg.
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.	.....	$140{,}000 \times 10^9$
	135°C.	.....	$35{,}000 \times 10^9$
	155°C.	.....	550×10^9

Comparative Hardness
(Smaller figure denoting greater hardness)

Wax — Load - - -	Average Penetration in cm. x 10^2 in 60 seconds at 25°C. under load indicated. ASTM D-5-25. 50 grs.	150 grs.	250 grs.
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	--	--

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TOWOLDMON0039205
WATER_PCB-00023674

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	80	161
				# 8	21	28
75	25	140	No	11	27	43
50	50	135	No	17	42	56
25	75	120	No	26	58	109
0	100	52	No	16	42	53

* Soft Portion
\# Hard Portion

Solubility

Solvent	Grs. Mixed Isomeric Terphenyl per 100 ml. of solvent	
	25°C.	75°C.
3A Alochol	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.)

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TOWOLDMON0039206
WATER_PCB-00023675

Solubility - 20% Solution of Mixed Isomeric Terphenyl

Solvent	Minimum Temp. °C. for complete solution (20 gms. Mixed Isomeric Terphenyl and 80 gms. solvent)
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

Temp. Range	Coefficient of Cubical Expansion Vol./unit vol./deg. C.	Coefficient of Linear Expansion Length/unit length/deg. C.
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.

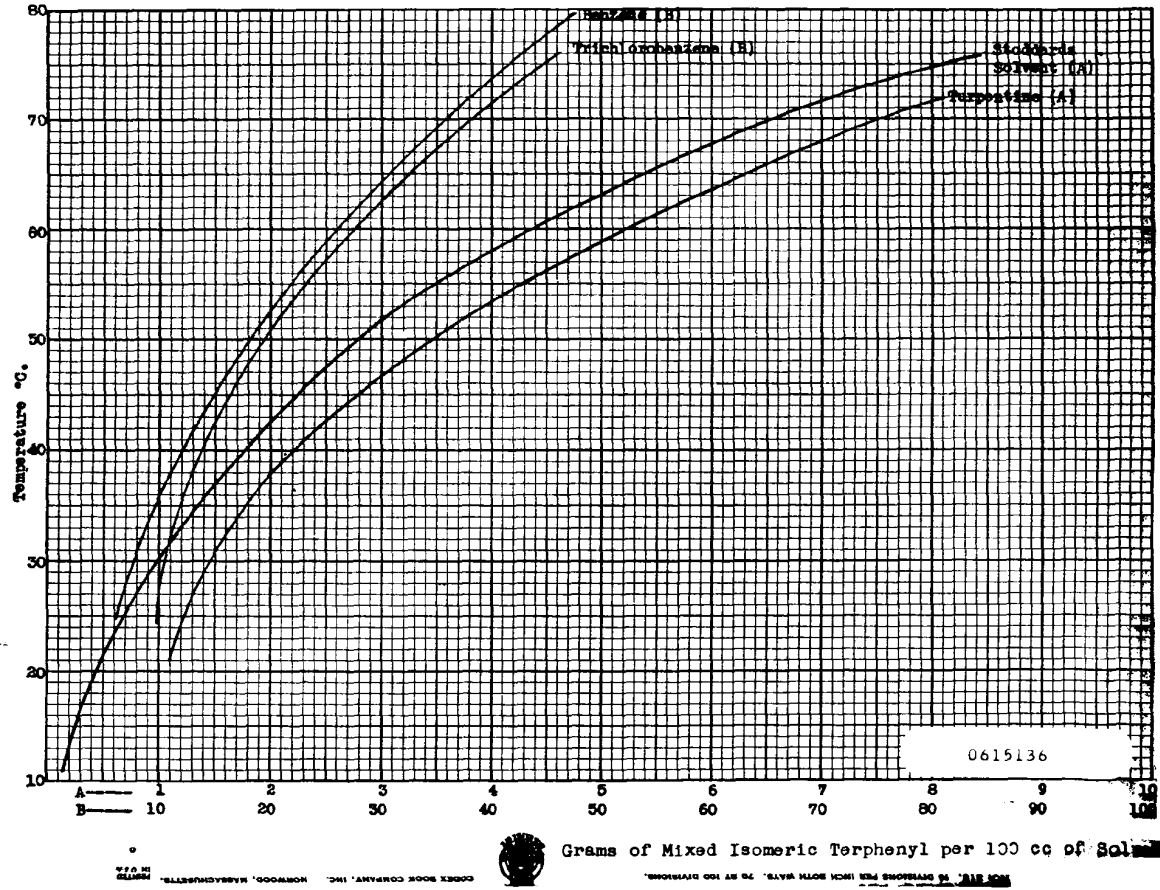
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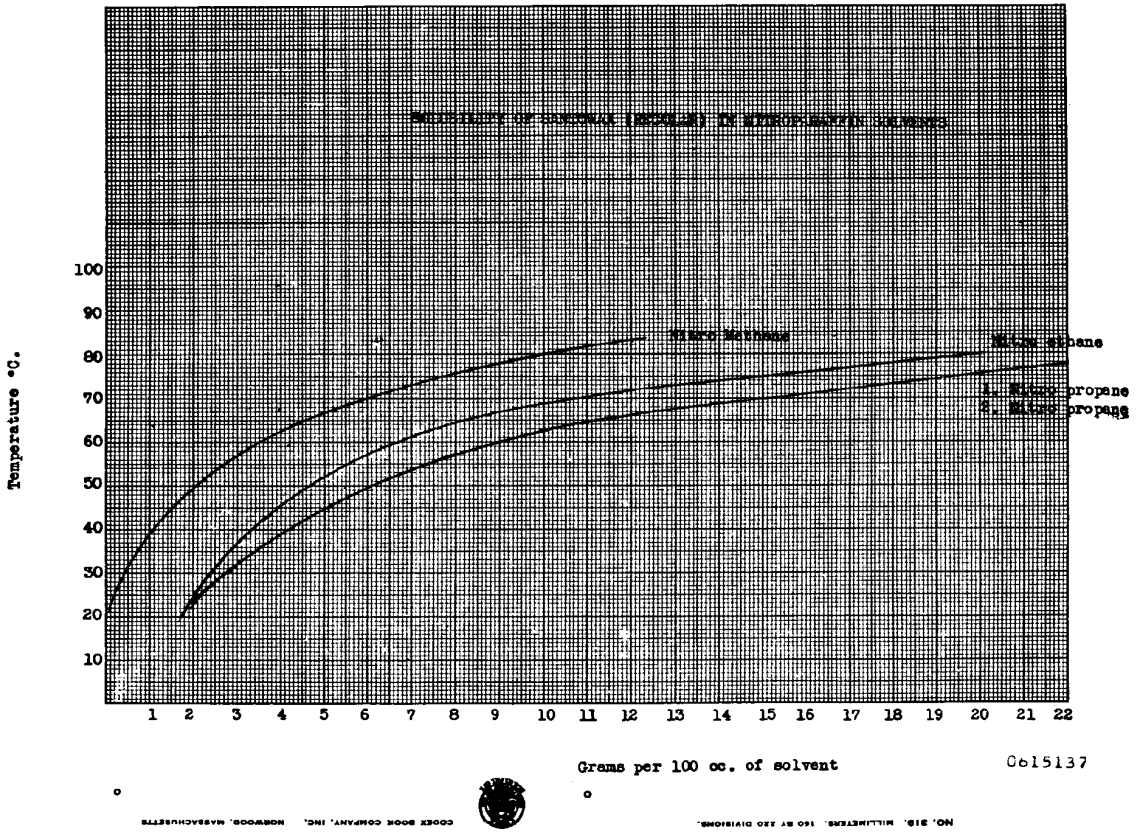
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TOWOLDMON0039207
WATER_PCB-00023676

SOLUBILITY OF MIXED ISOMERIC TERPHENYL



TOWOLDMON0039208
WATER_PCB-00023677



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TOWOLDMON0039209
WATER_PCB-00023678