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MONSANTO

MONTAR COMPOUNDS

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Monsanto Chemical Company, Organic Chemicals Division, St. Louis 1, Mo.

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GENERAL INFORMATION

*Montar** compounds are a series of high-melting, dark colored polyphenyls. Each has a characteristic range of properties. *Montar* 3, 4, 5 and 6 are chlorinated polyphenyls; *Montar* 9 is a mixture of straight polyphenyls.

All of these compounds are effective as low-cost binders or tackifiers, for adhesives, mastics, or hot-melt systems in which dark color is not objectionable. They are readily incorporated in rubber base adhesives for paper by first dissolving the *Montar* in a suitable solvent. (See Solubility Data, page 3.)

The chlorinated polyphenyls (*Montar* 3, 4, 5 and 6) contribute flame resistance to specialty asphalt products; concentrations of 30% or more yield products with instantaneous flame-out.

All *Montar* products are compatible with polyvinyl chloride up to about 10 parts per 100 parts of resin, and can be used as extender-type plasticizers to reduce formulating costs. Their composition suggests that they may be useful as plasticizers for a variety of other synthetic resins.

Montar compounds are readily available in large quantities. Sample quantities may be obtained. This bulletin presents sample formulations and information helpful in the development of new formulations.

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Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing patents covering any material or its use.

*Montar: Reg. U. S. Pat. Off.

This replaces Monsanto Technical Bulletin P-116.

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APPLICATIONS

Additives for Asphalt

All the *Montar* products are compatible with asphalt at ratios up to two parts for each part of asphalt. As illustrated in the table (below), *Montar* No. 4 (polychlorinated polyphenyl) contributes flame retardance at concentrations as low as 10%, with instantaneous flame-out above 30%. This property is caused by the formation of an intumescent layer on the surface of the mixture, which "snuffs" out the flame.

Composition	Flame-out Time
Pure Asphalt	210 seconds
10% *Montar* No. 4	90 seconds
20% *Montar* No. 4	10-20 seconds
30% *Montar* No. 4	Instantaneous
50% *Montar* No. 4	Instantaneous
60% *Montar* No. 4	Instantaneous

Both softening point and brittleness of the asphalt blend are increased as the concentration of *Montar* is increased. Blending is accomplished by thorough mixing, using heat where necessary.

Use in Rubber Adhesives

A 50% solution of either *Montar* No. 4 or No. 5 mixed with a 60%-solids rubber emulsion (1:1 ratio) yields a paper adhesive with good tack.

Emulsified Montar

The emulsifiability of all the *Montar* products suggests additional applications in the adhesives field. In a recent test, 5% of an emulsifier was added to a 50% solution of *Montar*, then the mixture was progressively diluted with water. The emulsion did not break until water dilution reached 160%.

Use in Vinyls

Up to 10 parts of any *Montar* can be blended with 100 parts of polyvinyl chloride resin by simple mixing.

TYPICAL PROPERTIES OF MONTAR COMPOUNDS

Property	Polychlorinated Polyphenyls				Polyphenyl
	Montar No. 3	Montar No. 4	Montar No. 5	Montar No. 6	Montar No. 9
Softening Point (ASTM), °C.	120 - 170	140 - 200	180 - 250	150 - 210	130 - 160
Acidity	..... Slightly Basic				0.1 - 0.3 mg. NaOH/gm.
Chlorine, %	50 - 52	54 - 56	53 - 56	59 - 61	None
CaO, %	5 - 10	5 - 10	1 - 3	2 - 5	.....
Fe, %	0.3 - 0.6	0.5 - 1.0	0.1 - 0.2	0.2 - 0.4	0.2 - 0.4
Flash Point	570° F. (298° C.)	None	None	None	495° F. (257° C.)
Fire Point	Above 650° F.	None	None	None	580° F. (304° C.)

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SOLUBILITY DATA

Montar No.	Benzene	Toluene	Kerosene	Methanol	Acetone
3	VS	VS	S	SS	VSS
4	VS	VS	S	SS	VSS
5	VS	VS	VS	SS	SS
6	VS	VS	VS	SS	SS
9	VS	VS	SS	I	SS

Key: I — Insoluble
VSS — Very slightly soluble
SS — Slightly soluble
S — Soluble
VS — Very soluble

AVAILABILITY

All *Montar* compounds are commercially available from Monsanto's Organic Chemicals Division in St. Louis (P. O. Box 478), Missouri.

TOXICITY AND SAFE HANDLING INFORMATION

No formal toxicity data exist on *Montar* compounds. As a general precaution, prolonged skin contact should be avoided, especially when working with solutions of the compounds. Otherwise, the compositions can be handled in the same manner as roofing tar.

THIS BULLETIN REPLACES
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For further information on the products described in this bulletin
contact the nearest Monsanto office.

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