Monsanto

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SUBJECT : CHLORINATED ALIPHATIC HYDROCARBONS IN POLYSULFIDE RUBBERS

REFERENCE :

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Evaluations have been completed to determine the usefulness of various chlorinated aliphatic hydrocarbons in polysulfide rubber systems. Initially, evaluations began with chlorinated C_6, C_8, or C_{10} olefins. A severe odor problem exists with these materials, they are unstable and, unless stabilized with epoxy, fume badly at room temperature. In polysulfides extreme cure retardation, characteristic of highly acidic modifiers, was seen with both stabilized and unstabilized material. When these disadvantages are coupled with the high volatility of the materials, it is felt that no application exists for these materials in polysulfides.

Further tests were made with C_{12}-C_{14} chlorinated paraffins. Tests showed that the material was compatible with LP-32 polysulfide resin but, when cured, severe exudation was seen. This basic incompatibility appeared with both stabilized and unstabilized chlorinated paraffin. Again, a distinct odor is found (in this case controllable with epoxy) but a cure rate retardation was again evident. These reasons are sufficient to eliminate the C_{12}-C_{14} materials.

Evaluations of chlorinated paraffins from higher molecular weight material indeed showed that performance similar to Cereclor 52 or Chlorowax 500 could be maintained. All samples showed slight incompatibility in the cured state but might be useable in some applications. No major performance variations were seen and, as chlorinated paraffins are generally too efficient, slightly incompatible, and unstable, it is expected that this material will not be much better or worse than Cereclors, Flexclors or Chlorowaxes.

It is probable that a chlorinated paraffin could be used in polysulfides particularly if general stability and efficiency problems could be eliminated. A low molecular weight polymer of vinyl chloride, as informally suggested

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by J. W. Hirzy and W. Vanderlinde, could be most interesting as well as quite cheap. This avenue has been previously explored but a new look might be worthwhile particularly as straight chlorination seems unpromising.

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