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SOLVENT COMPOSITION

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This invention relates to new compositions of matter and to methods of preparing and using the same. While these compositions may have a wide variety of uses, they are particularly effective as solvents for the removal of carbon and gum deposits from internal combustion engines.

It is well known that in the course of manually handling hydroxy benzene ring compounds, such as phenol and cresol, there is a relatively high degree of hazard involved due to the fact that such compounds cause severe irritation to human skin with which they come in contact, such as, for example, the skin covering the hands, arms and face. This escharotic or irritant property of the hydroxy benzenes seriously interferes with the use of such compounds for many applications. This has been found to be particularly true when using such materials as solvents or as components of solvents used for the removal of carbon and gum deposits from internal combustion engines. It is frequently desirable to apply such solvents to the engines by injecting the solvent into the affected zones with a pressure atomizer.

A preferred method of injecting the solvent is to remove the air cleaner from the carburetor and while the engine is running, slightly faster than idling, a suitable portion of the composition is injected into the throat of the carburetor. The ignition is then turned off, the spark plugs removed and additional composition injected into the engine through the spark plug holes, using the pressure atomizer. The spark plugs are replaced, the engine allowed to stand for about fifteen minutes, then run for a short period of time with the throttle partially opened and then accelerated intermittently until the exhaust is substantially devoid of smoke.

Under such conditions of use it is almost impossible to prevent particles of solvent from getting on the hands, arms or even face of the person operating the atomizer and serious dermatitis conditions result.

It is an object of this invention to provide novel compositions of matter containing hydroxy benzenes or homologues thereof which are substantially non-irritating to human epidermis.

It is a further object of this invention to provide compositions of matter containing hydroxy benzenes or homologues thereof which do not cause dermatitis when contacted with human epidermis and which are useful for removing carbon and gum deposits from internal combustion engines.

Other objects and advantages will be apparent from the following description.

It has now been found that the escharotic action of certain hydroxy benzenes including homologues thereof, such as phenol, cresol, xylenol and carvacrol may be substantially, if not completely, inhibited by simply mixing with one or more of the foregoing materials, a suitable proportion of one or more miscible esters of aromatic acids, particularly alkyl esters of aromatic dicarboxylic acids. Suitable esters include benzyl benzoate, dibutyl phthalate, dimethyl phthalate and amyl phthalate.

The amount of such esters which is required to eliminate the escharotic action of the hydroxy benzene compounds varies widely depending upon the particular hydroxy benzene ring compounds employed and the specific ester or esters used therewith. For example, it is well known that the escharotic action of phenol and cresol is greater than that of most of the other hydroxy benzene ring compounds and it is apparent therefore that a smaller amount of ester would be required to eliminate the escharotic action of the latter compounds than would be required in the cases of phenol and cresol.

In order to determine the amount of ester required to bring about the desired results, a very simple test may be employed. A few drops of the composition to be tested are placed on the skin on the inner side of the wrist and allowed to remain there for about three minutes. If at the end of this time no burning or irritating sensation is noted, the composition may be said to have substantially no escharotic action.

The escharotic action of cresol so far as is known is one of the most vigorous of any of the hydroxy benzene ring compounds, yet it has been found that when compositions are prepared containing 67% by volume of commercial cresol and 33% of dibutyl phthalate, such compositions have substantially no escharotic action. Similar results are obtained with compositions containing 50% by volume of cresol and 50% benzyl benzoate.

The effectiveness of such compounds as gum solvents was demonstrated by the following method: Samples of gum obtained by exposure of cracked gasoline stocks to oxygen under elevated temperature and pressure were dissolved in acetone and sprayed on heated strips of shim stock. On striking the heated metal, the volatile solvent evaporated leaving a smooth varnish-like deposit. The amount of gum thus deposited, preferably about 1.5 to 2 grams, was determined

by weighing the shim stock before and after the deposition. After coating with gum, the shim stock was inserted as a sleeve in a chamber, the temperature and pressure of which was controlled to simulate conditions in the intake manifold of standard internal combustion engines, namely, about 200° F. and a vacuum of about 16" of Hg 1000 cc. of a 5% by volume solution of the solvent under test dissolved in a regular grade gasoline was supplied thereto in an atomized state through a standard Carter carburetor. The solvent was dissolved in gasoline in order to diminish the solvent power to a point where all of the gum on the shim stock would not be removed under the foregoing test conditions. The shim stock was weighed after the solvent treatment and the loss in weight of gum deposit divided by the amount of gum deposit originally present multiplied by 100 gave the percent gum removal. When employing a composition consisting of 50% by volume of a commercial cresol (a mixture of about 35% ortho, 40% meta and 25% para cresols and containing small amounts of phenol and xylenols) and 50% dibutyl phthalate in the foregoing procedure, 84% of the gum deposit on the shim stock was removed.

It is apparent that many combinations of hydroxy benzenes and esters may be employed and that widely varying proportions of materials can be used. However, in general, superior results have been obtained when using compositions containing about 33% to 50% of dibutyl phthalate or benzyl benzoate and 67% to 50% of phenol or cresol. This ratio of hydroxy benzene ring compounds and esters is preferably maintained when such compounds are used in conjunction with one or more additional materials.

The invention is not limited to the foregoing specific compositions which are given by way of example only but is to be limited only by the following claims.

We claim:

1. A composition comprising a hydroxy benzene ring compound having escharotic action on the skin in such quantity as to impart to said composition escharotic action in the absence of an agent to counteract such action, and an amount of an aromatic acid ester, miscible with said compound, sufficient to substantially inhibit said escharotic action.

2. A composition in accordance with claim 1 where the ester is benzyl benzoate.

3. A composition in accordance with claim 1 where the ester is a lower alkyl ester of an aromatic dicarboxylic acid.

4. A composition in accordance with claim 1 where the ester is an alkyl ester of an aromatic dicarboxylic acid in which the alkyl group contains less than six carbon atoms.

5. A composition in accordance with claim 1 where the ester is a lower alkyl ester of phthalic acid.

6. A composition in accordance with claim 1 where the ester is dibutyl phthalate.

7. A composition in accordance with claim 1 where the ester is dibutyl phthalate and the amount of dibutyl phthalate is between approximately 50% and 100% by volume of the hydroxy benzenes.

8. A composition in accordance with claim 1 in which the hydroxy benzene ring compound is cresol, the aromatic acid ester is benzyl benzoate and the cresol and benzyl benzoate are present in a ratio of from 67 to 50 parts by volume of cresol to from 33 to 50 parts by volume of benzyl benzoate.

9. A composition of matter having non-escharotic action on the skin comprising approximately 67% by volume of cresol and 33% dibutyl phthalate.

10. A composition of matter having non-escharotic action on the skin comprising approximately 50% by volume of cresol and 50% benzyl benzoate.

11. A solvent for removing carbonaceous deposits from internal combustion engines comprising cresol in such quantity as to impart to the solvent escharotic action on the skin and dibutyl phthalate in which the ratio of cresol to dibutyl phthalate is 67 to 50 parts by volume of the former to from 33 to 50 parts by volume of the latter.

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