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MINERAL WAX COMPOSITION

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Refined paraffin waxes in general require quite meticulous refining treatment to produce a wax which is stable against the formation of color bodies resulting in a yellowing of the wax over long periods of exposure of the wax to normal atmospheric and light conditions. This becomes particularly acute and is a controlling factor in the salability of the wax when the wax is utilized as a covering for, as a coating for, or otherwise in connection with food products. Since the formation of adverse color in the wax detracts materially from the appearance of the product with which it is associated, the color stability of the wax becomes a matter of very considerable importance over and beyond the value of the wax itself.

Numerous attempts have been made to increase the color stability of waxes by highly rigorous methods of refining, as, for example, treatment with sulfuric acids under extreme conditions.

This invention is directed to the stabilization of wax against the formation of deleterious color after long exposure to normal atmospheric and light conditions under prolonged periods of time and has for its object the provision of a wax so stabilized by the addition thereto of certain ingredients not heretofore used for such purposes.

This invention is based upon the discovery that the esters of the aliphatic monohydric alcohols generally when mixed with wax in small amounts tend to materially increase the capability of the wax for resisting color deterioration under conditions of prolonged exposure to light at temperatures near atmospheric.

Of the various esters of aliphatic monohydric alcohols which may be used, several sub-classes appear to be particularly effective. For example, we may use the alkyl esters of aliphatic hydroxy acids such as for example dibutyl tartrate, amyl lactate, tributyl citrate and other similar esters. As a second class, we have found alkyl esters of many dibasic acids to be particularly effective and in particular in this general group have found effectiveness resident in the alkyl esters of phthalic acids, such as for example, diamyl phthalate. As a third class of useful esters we have found stabilization characteristics resident in alkyl esters of mineral acids specifically the oxygen acids of phosphorus, such as for example, tributyl phosphate.

To exemplify the color stabilizing effect of these various compositions, there are cited below results obtained in two tests. In each of these tests blocks of 126° F. A. S. T. M. melting point scale wax having the dimensions 6 in. x 1½ in. x ½ in. with and without added inhibitors were exposed upon the roof of a building where they were called upon to withstand full sunlight exposure. In the first series of tests set forth in Table I, the duration of the exposure was 28 days. In the second series of tests, set forth in Table II, the duration of the exposure was 53 days.

Table I

[6" x 1½" x ½" blocks of 126° F. A. S. T. M. melting point scale wax, with and without added inhibitors—exposed on roof for 28 days]

Samples	Material added	Conc.	Color after test
		Per cent	
Blank	None		Light yellow.
Samples lighter in color than blank after 28 days exposure on roof.	Tributyl phosphate	1.0	No change.
	do	5.0	
	Tributyl citrate	5.0	
	Dibutyl tartrate	3.0	
	Tributyl phosphate	0.10	

Table II

[6" x 1½" x ½" blocks of 126° F. A. S. T. M. melting point scale wax, with and without added inhibitors—exposed on roof for 53 days]

Samples	Material added	Conc.	Color after test
		Per cent	
Blank	None		Yellow.
Samples lighter in color than blank after 53 days exposure on roof.	Dibutyl tartrate	1.0	
	Amyl lactate	1.0	
	Diamyl phthalate	1.0	
	Tributyl phosphate	1.0	No change.

On all of the above tests the samples after exposure were compared both with the blank and with similar blanks which had been protected from color deterioration. In all cases the color of the exposed sample was commercially improved over that of the uninhibited blank. In those tests wherein the color after test is noted "No change," this means that the color of the inhibited test block after the indicated exposure was exactly the same as the color of a fresh and unexposed block. Since no quantitative standards are in common use for expressing the color of wax, the data must necessarily be presented in the above form.

It is evident from the above tests that the inhibitors with which this invention is concerned are capable of effecting important changes in the liability of a commercial paraffn wax to the formation of deleterious color.

The amounts in which these various inhibitive agents may be used will vary principally with the

capability of the inhibitive agent and with the type of exposure to which it is believed the product may be subjected, in general, however, the range of concentrations to be used will be from 0.01 to 5.0 weight percent with the preferred concentration being at about 1% by weight of the additive agent.

We claim:

1. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of a small amount of an ester of an alkyl monohydric alcohol and an oxygen containing acid selected from the group consisting of aliphatic hydroxy acids, phthalic acid, and oxygen acids of phosphorus.

2. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of from 0.01 to 5.0 weight per cent of an ester of an alkyl monohydric alcohol and an oxygen containing acid selected from the group consisting of aliphatic hydroxy acids, phthalic acid, and oxygen acids of phosphorus.

3. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of a small amount of an alkyl ester of an aliphatic hydroxy acid.

4. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of a small amount of an alkyl ester of phthalic acid.

5. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of a small amount of an alkyl ester of an oxygen acid of phosphorus.

6. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of from 0.01 to 5.0 weight percent of an alkyl ester of an aliphatic hydroxy acid.

7. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of from 0.01 to 5.0 weight percent of an alkyl ester of phthalic acid.

8. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of from 0.01 to 5.0 weight percent of an alkyl ester of an oxygen acid of phosphorus.

9. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of a small amount of an alkyl ester of an acid selected from the group consisting of tartaric, lactic, and citric acids.

10. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of a small amount of diamyl phthalate.

11. A white refined paraffin wax product inhibited against the formation therein of deleterious color upon prolonged exposure to light by the addition thereto of a small amount of tributyl phosphate.

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