REDUCTION OF OBJECTIONABLE ODORS OF MATERIALS

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This invention is a new and useful improvement in the reduction of objectionable odors of materials and is a continuation-in-part of application Serial No. 196,725, now abandoned.

Many industrial materials are characterized by an inherent objectionable odor which in many instances impairs their usefulness or the range of their application.

One object of the instant invention comprises, among others, a composition which, when added to a relatively malodorous material, will reduce the odor thereof, or, in a given case entirely cancel the same.

The foregoing and further objects of the invention will appear from the following description:

My invention is especially applicable to the reduction of objectionable odors arising in and from a great variety of industrial processes and products. Inter alia, my invention is applicable to the reduction of odors in paints, consisting predominantly by volume of a drying oil, such as for example linseed oil or fish oil; my invention is also applicable to the fatty acids including stearic, oleic, palmitic, etc.; my invention is also applicable to petroleum distillates and residues of from high to low boiling points; my invention is also applicable to waxes, whether derived from petroleum or otherwise; my invention is also applicable to vegetable oils including cottonseed, corn, palm, castor, peanut, soya bean, coconut, rapeseed linseed; my invention is also applicable to animal fats and oils including fish, whale, tallow and lard oil; my invention is also applicable to the raw materials for and the products from the rendering and dehydrating of animal remains; my invention is also applicable to synthetic plastics, elastomers, lacquers, printing inks and products made therefrom or on which they are used; my invention is also applicable in the pulp and paper industry and their products; my invention is also applicable to the reduction of odors in space as they arise from industrial operations or industrial products or from occupancy.

In the application of my invention I first take the substance of undesirable odor and by adding to portions of it small amounts of aliphatic alcohol of from 6 to 9 carbon atoms, I determine which of these or what mixture of these when added to the material, and as progressively added, will aggravate and extend the objectionable odor of the material to which it is being added. In practice the amount to be added is the minimum which will give the maximum aggravation or extension of the odor of the original material. Once this point has been reached, the addition of further amounts will not produce any further desirable effect. The amount to be added for this purpose is found usually within a range of from 0.02% to 0.05% by weight of the material. Within the range of aliphatic alcohols I find the straight chain and modified chain alcohols as most useful.

In the next step of my invention, taking samples of the composition containing that amount of the aliphatic alcohol which has been found to produce the optimum effect, I next add a ketone selected from the aliphatic methyl ketones ranging from hexyl to nonyl in relatively small amounts and determine the amount of this which, when added, will progressively reduce or in some cases entirely cancel the objectionable odor as extended of the composition. Once the maximum reduction has been obtained, the addition of further amounts will produce no further desirable effect. In practice the optimum amount of the ketone is found usually to range from 0.0007 to 0.05% by weight of the material treated.

The useful range of components in the mixture of aliphatic alcohols and ketones is from 10–90% by weight of the total mixture of the aliphatic alcohol, and from 10–90% by weight of the total mixture of the ketone. Having determined the amounts needed for treating a given material to reduce its odor, it is no longer necessary to proceed in a stepwise fashion. A suitable mixture of proper proportions of the alcohol and ketone is prepared for use direct with the material.

When adding the composition in accordance with the invention to a normally malodorous industrial material, it is preferred to add said composition in amount of from 0.0007 to 0.1% by weight of the material to be treated.

The materials specified are relatively insoluble in water. In plant processing of materials with objectionable odors or plant processes from which objectionable odors arise, it is often desirable to use a water-soluble deodorizer. The mixtures of the invention can be made soluble in water by being dissolved first in an adequate quantity of a solubilizer, such as propylene glycol or by the addition of a wetting or surface agent or emulsifier. In place of propylene glycol, other glycols, such as ethylene glycol or triethylene glycol may be used. The resulting composition can be added to process waters or at steps in the process where water is present and the deodorizing or odor reducing action of the composition is obtained. The glycol used in accordance with this aspect of the invention should be one readily soluble in aqueous medium. The amount of glycol added will be sufficient to act as a linking agent, maintaining the ingredients of the composition in solution in the aqueous medium to which the same is added.

The following examples are furnished by way of illustration and not of limitation:

Example 1

In connection with most rendering plants the objectionable odor of putrid meat, animal entrails, bones and fat was greatly reduced by spraying the material with a mixture of 50% methyl-hexyl ketone and 50% n-hexanol. In order to make the material water soluble 1% of Tergitol 08 or any other wetting or surface active agent is used. A 3% aqueous solution is used to spray the empty collecting drums having contained these unprocessed rendering plant materials, the trucks in which these cans were carried and the floors and walls of these plants to remove the putrid odor associated with these products.

Example 2

0.01% by weight of a mixture of equal parts of hexanol and methyl hexyl ketone was added to an unpleasant smelling petroleum distillate resulting from an oil cracking process. Most of the odor was eliminated although some remained.

Example 3

0.015 part by weight of a mixture of equal parts of hexanol and methyl hexyl ketone was added to the distillate identified in Example 2 with the result that the residual odor was still further reduced.

Example 4

2 drops of a mixture of equal parts of n-hexanol and methyl hexyl ketone was added to a pint of kerosene
having a pronounced odor. The odor was materially reduced.

Example 5

A 10% solution of equal parts of n-hexanol and methyl hexyl ketone in propylene glycol was spread on a fibre board made from macerated waste newspapers and having an objectionable odor. An amount of 0.7% by weight of the solution based on the weight of the fibre board eliminated the odor.

Example 6

3 drops of a mixture of equal parts of n-heptanol with methyl nonyl ketone was added to a pound of naphthenic acid having a characteristic objectionable odor. The odor was substantially reduced.

Example 7

12 drops of a mixture of equal parts of octanol and methyl hexyl ketone was added to a one-pound portion of warm soap acids having an objectionable odor. The odor was markedly reduced.

Example 8

12 drops of a mixture of equal parts of hexanol and methyl hexyl ketone was added to a one-pound portion of warm soap acids having an objectionable odor. The odor was substantially reduced.

Example 9

8 drops of a mixture of equal parts of n-heptanol and methyl hexyl ketone was added to an one-pound portion of warm soap acids having a disagreeable odor. The odor was substantially reduced.

Example 10

2 drops of a mixture of equal parts of hexanol and methyl nonyl ketone was added to 1 pound of a blown fish oil with a typical fish oil odor. The odor was substantially reduced.

Example 11

A sample of ground meat which had been kept at room temperature for several days and had a pronounced disagreeable odor was sprayed with a mixture of 50 parts by weight of octanol and methyl hexyl ketone. The odor was very substantially reduced although not entirely eliminated.

Example 12

A sample of ground meat which had been kept at room temperature for several days and had a pronounced disagreeable odor was sprayed with a mixture of equal parts of n-heptanol and methyl hexyl ketone. The odor was substantially reduced although not entirely eliminated.

Example 13

A sample of ground meat which had been kept at room temperature for several days and had a pronounced disagreeable odor was sprayed with a mixture of equal parts of n-hexanol and methyl hexyl ketone. The odor was substantially eliminated.

Example 14

The objectionable odor in an occupied area was reduced by atomizing a solution of 1.5% of n-hexyl alcohol and 1.5% of methyl hexyl ketone in 48.5% of triethylene glycol and 48.5% of isopropanol (99% purity).

I claim:

1. An odor reducing composition consisting essentially of from 10–90% by weight of an aliphatic alcohol selected from the group consisting of normal alcohols of from 6–9 carbon atoms, and from 10–90% by weight of an aliphatic ketone selected from the group consisting of methyl ketones ranging from hexyl to nonyl.

2. An odor reducing composition consisting essentially of approximately 50% by weight of an alcohol selected from the group consisting of aliphatic alcohols of from 6–9 carbon atoms and approximately 50% by weight of an aliphatic ketone selected from the group consisting of methyl ketones ranging from hexyl to nonyl.

3. An odor reducing composition according to claim 1 dissolved in a water-soluble glycol.

4. An odor modifying composition consisting essentially of approximately 50% by weight n-hexanol and approximately 50% by weight of methyl hexyl ketone.

References Cited in the file of this patent