UNITED STATES PATENT OFFICE

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PROCESS OF PREPARING A NAPALM COMPOSITION CONTAINING A FINELY DIVIDED INERT CARRIER

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This invention relates to improved napalm. It more particularly relates to an improvement in the process for the production of napalm for use in the gelling of gasoline.

The use of gelled gasoline for bombs, flame throwers, and as fuel for certain solid fuel burners is well known. This gelled gasoline is conventionally produced by adding napalm to gasoline which will cause a gelling thereof in a relatively short time.

This napalm is conventionally produced by saponifying a melted mixture of coconut oil fatty acids, naphthenic acid and oleic acid with a sodium hydroxide solution, precipitating napalm from the saponified mixture by the addition of hydrated aluminum sulfate and drying the napalm precipitate to form the napalm to be used in the gelling of the gasoline.

The napalm produced according to this method is generally not uniform in appearance and usually consists of crumby and tacky granular particles.

In order to gel gasoline with the napalm, it has been found necessary to heat the gasoline to about 80° F. prior to the napalm addition and to add xylene to aid in the gelling. The heating of the gasoline is, of course, extremely dangerous and entails a constant hazard of combustion and explosion. The use of xylene is very undesirable, as it is extremely toxic, corrosive to the skin, and thus very difficult to handle.

A process for grinding this crumby and tacky napalm in order to overcome these difficulties is described in United States patent application Serial No. 254,437, filed November 1, 1951, and now abandoned. In the process described in this application, this tacky and granular napalm which is generally unadaptable for grinding, is ground into a reactive and uniform pulverulent mass. This grinding, however, is not entirely satisfactory, as it involves additional power use, equipment and expense.

One object of this invention is the production of a uniform, finely pulverulent napalm without grinding.

A further object of this invention is a napalm which may be used to gel gasoline in a highly satisfactory manner at any temperature above freezing.

A still further object of this invention is a napalm which may be used to gel gasoline in an excellent manner without the addition of xylene. These and still further objects will become apparent from the following description:

I have now found that a very uniform and finely powdered napalm may be consistently produced without grinding if an inert carrier material such as diatomaceous earth, talc, silica gel, activated carbon or aluminas is added during the production of the napalm at any point in the process prior to the drying.

The inert carrier material should be finely divided and have a particle size which will.at least predominantly pass through a 100-mesh screen, and should preferably predominantly pass through a 200-mesh screen. The inert carrier material should be added in an amount of at least about 5% by weight of the total napalm formed and should preferably be present in amount of about 20% by weight of the total napalm formed.

Though there is no upper limit on the amount of inert carrier material which may be used, I have found that it is not advisable to use in excess of about 20% by weight with reference to the total napalm formed in that too large a proportional amount of the inert carrier may act as a diluent and necessitate a relatively larger amount of napalm for the gelling of the gasoline.

Though the inert carrier may be added at any point in the process prior to the drying of the napalm, I have found it preferable to add the inert carrier material after filtering the saponified mixtures of the organic acids and prior to the addition of the aluminum sulfate. I have also found it advantageous to add an additional amount of the inert carrier material after the saponified mixture is precipitated by the aluminum sulfate. This additional inert carrier material may be added after the precipitate has been filtered and the filtrate mixed with clean water.

At whatever point the inert carrier is added to the process, it is necessary that the same be thoroughly mixed and dispersed in the reactants.

The details of the invention will be more clearly illustrated from the following examples which are given solely for this purpose and are not intended in any way to limit the scope of the invention:

Example 1

25 grams of coconut oil fatty acids, 12.5 grams of naphthenic acid and 12.5 grams of oleic acid were melted together and added to 1,000 cc. of water containing 11.5 grams of 95% powdered sodium hydroxide. The solution was heated to 150° F. and stirred for ten minutes. 5 grams of activated carbon were added and the stirring continued for five minutes. The solution was then filtered and the clear filtrate cooled to room temperature. 10 grams of diatomaceous earth sold under the trade name of "Celite" were added
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to the cooled, clear filtrate. 37 grams of Al(SO₄)·18H₂O were dissolved in 100 cc. of water and then slowly added to the clear filtrate containing the "Celite." A napalm Celite mixture precipitated. This mixture was filtered and transferred to a beaker with clean water and 3 grams more of Celite added with stirring. The mixture was filtered and the filter cake washed and dried in an oven at 50° C. The dried product obtained was very fine and broke up easily into a fine, uniform, light powder. This fine powdery napalm Celite mixture proved very excellent for the gelling of gasoline. Conventional amounts will gel aviation gasoline in 23 seconds at 70° F. and five minutes and 55 seconds at 32° F. No additive such as xylol was needed to aid in the gelling.

Example 2

The process as set forth in Example 1 was repeated, using in turn silica gel, talc, activated carbon and alumina. The silica gel and talc produced a napalm composition which was equal in every manner to that formed with Celite. The alumina and activated carbon each produced a napalm composition superior to that produced by conventional methods and which could be used for gelling gas at temperatures below 80° C. without the use of xylol. The product obtained with the use of the carbon black and alumina did not, however, reach the overall excellence of that obtained with the use of Celite silica gel.

Though the napalm treated in the above example is a napalm produced in the conventional manner with the use of coconut oil, fatty acids, naphthenic acids and oleic acids, the new process is applicable for use in the production of napalm with any organic acids or variations of the organic acids conventionally used for this purpose.

It is thus apparent that the invention essentially comprises the addition of an inert carrier such as diatomaceous earths, silica gel, activated carbon or alumina having a particle size at least small enough to predominantly pass through a 100 mesh screen and preferably finer to the reactants used in the production of napalm at any point in the process prior to the drying thereof, in amount equal to at least 5% by weight of the napalm formed.

I claim:

1. In the process for the production of an aluminum soap of a mixture or organic acids selected from coconut oil fatty acids, naphthenic acid and oleic acid, adapted on addition to gasoline to cause a gelling thereof, which process includes saponifying a mixture of said organic acids with sodium hydroxide, thereby producing a sodium soap of said organic acids, followed by precipitation of the aluminum soap of said organic acids by adding aluminum sulfate to an aqueous solution of said sodium soap, and thereafter drying the said aluminum soap, the improvement which comprises adding to and dispersing into said materials prior to said drying from 5-30% by weight of the aluminum soap so formed of a finely divided inert carrier having a particle size which will at least predominantly pass through a 100 mesh screen, selected from at least one member of the group consisting of diatomaceous earth, silica gel, talc, activated carbon and alumina, and after said drying recovering a uniform pulverulent aluminum soap.

2. Process according to claim 1 in which at least part of said finely divided inert carrier is added to and dispersed in said materials after said saponification and prior to said precipitation.

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