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3,795,747

ALCOHOL-CONTAINING POWDER

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

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4 Claims

ABSTRACT OF THE DISCLOSURE

Flowable powders having up to 60% ethyl alcohol content are prepared by the sorption of the alcohol with bulked, low dextrose equivalent dextrans. The resulting products are stable when hermetically packaged and are particularly qualified as alcoholic beverage forming compositions and flavoring materials.

BACKGROUND OF THE INVENTION

1. Field of the invention

The present invention generally relates to alcohol-containing solids and, in particular, is directed to powders containing substantial amounts of alcohol. More specifically, the invention pertains to edible, ethanol-containing carbohydrate powders.

2. Description of the prior art

Prior efforts to make edible, alcohol-containing powdered materials have been limited to the use of carbohydrate materials in very dry condition in order to have a significant amount of alcohol, specifically ethanol, sorbed by the dehydrated solids. For the most part, the prior art has employed carbohydrates which are either undesirably sweet or those which dissolve with considerable difficulty in cold water to produce cloudy appearing beverages. Also, because of the relatively low levels of alcohol fixation, in order to obtain effective levels of alcohol in the beverages prepared by reconstituting the prior art powders, it has been necessary to include excessive amounts of carbohydrate fixative. The presence of excess carbohydrate fixative produces beverages having too high viscosity, poor appearance and texture.

Sato, (Great Britain 1,138,124) discloses the use of anhydrous lactose as a medium for adsorbing and/or absorbing ethanol. Sato identifies lactose anhydride as the material for combination with the ethyl alcohol to provide a stable alcohol-containing powder and implies that anhydrous alcohol must be employed in the preparation of the product since the presence of water would convert the lactose to the unacceptable hydrated crystalline form.

Bode, (U.S. 3,436,224) describes the preparation of an alcoholic dry beverage powder by dehydrating a vapor-sorbable particulated, starch based polysaccharide material to a moisture content of less than 0.75% and exposing the dehydrated material to anhydrous ethanol.

In both instances, it is to be noted, the prior art processes rely upon the substantially complete removal of physically or chemically combined water from the solid prior to and during the sorption of ethanol by the dehydrated solid substances. In contrast to the prior art, it has now been discovered that certain carbohydrate materials, when suitably modified with respect to physical form, will, in the presence of significant amounts of water, sorb large quantities of alcohol to form stable, flowable carbohydrate powders containing up to 60% by weight ethanol. Significantly, certain of these alcohol-containing powders will readily dissolve in cold water to form low-viscosity, clear, colorless, alcoholic solutions.

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SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a flowable, high alcohol-containing powder which can be produced in the presence of substantial quantities of moisture and which, when packaged in a sealed container, is stable.

It is another object of the invention to provide a high ethanol-containing carbohydrate powder which readily dissolves in cold water to form a clear, low-viscosity, colorless liquid.

It is another object of the present invention to provide a high ethanol-containing powder which is flowable and has a minimum tendency to lump and otherwise form compacted aggregates.

It is still another object of the invention to provide a high ethanol-containing powder which can be used as a base for alcoholic beverages.

It is yet another object of the invention to provide a powder, which in addition to containing up to 60% ethyl alcohol is also amenable to the sorption of flavoring agents, particularly those usually employed in alcoholic beverages.

It is a feature of the invention that novel alcohol-containing powders are produced by utilizing the heretofore unrealized capabilities of certain modified carbohydrates to sorb large quantities of ethanol when contacted and blended with the alcohol.

Briefly stated, the objects of the invention are accomplished by bulking, i.e., increasing the bulk volume and effective surface area of specific low D.E. (dextrose equivalent) dextrans and blending the bulked dextrans with liquid ethyl alcohol in ratios such that there is sufficient dextrin present to absorb/adsorb the available ethanol and produce a dry-to-the-touch flowable powder incorporated with up to about 60% ethanol. When hermetically packaged, even though the alcohol containing powders have, in addition to 60% alcohol by weight, as much as 4.6% water, they remain chemically stable and in flowable physical condition. The products of the invention can have excellent cold water solubilities and reconstitute to provide non-sweet, low viscosity, clear colorless and sparkling liquid solutions.

The essence of the invention resides in the discovery that dextrans having low dextrose equivalent values of from about 5 D.E. to about 15 D.E. and which have been expanded to a low bulk density of from about 0.05 g./cc. to about 0.30 g./cc. have the capability for adsorbing/absorbing large amounts of alcohol. Among these dextrans are some special dextrans which are excellent film-forming materials; which can be bulked (as above) to produce low bulked density materials whose bulked physical conditions are not easily altered upon compression; and which are distinguished from the normal dextrans by having the capabilities of dissolving readily in cold water to form clear, sparkling, low viscosity and nonsweet solutions with no off-flavors. Such special dextrans have a D.P. (degree of polymerization) of from 1 to about 20 glucose units with an average D.P. of about 10 (molecular weight about 1600). Furthermore, in comparison with the normal dextrans, the special dextrans, which can be produced by enzymatic hydrolysis (e.g. alpha amylase from *B. subtilis*) contain about 10% less polymers in the D.P. range above 10 than the normal dextrans having the same D.E. and they have a preponderance of trimer, hexamer and heptamer content equivalent to more than 50% of the oligomers (D.P. 10 and below). Additionally, the special dextrans have only a trace to about 1% glucose and a very limited amount of maltose.

In summary, the low sweetness level of these special dextrans is derived from the limited amount of glucose and maltose present, the low viscosity and good solubility and clarity is due to the reduced level of the higher D.P.