Stabilizing Citrus Beverages

Fran LaBell, Field Editor

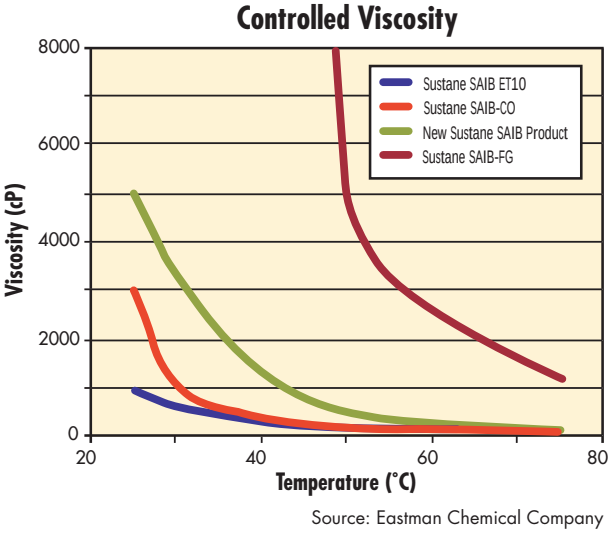
The same citrus oils that give citrus flavor beverages their delicious and refreshing taste pose a problem for beverage manufacturers who want their bottled products to maintain a good shelf appearance.

"Without help, a ring would form around the top, and there might even be sediment at the bottom of the bottle. The product would separate," explains Bobbi Buford, global market development executive, Eastman Chemical Co., Kingsport, Tenn.

The weighting agents contribute opacity without contributing color in non-carbonated or carbonated beverages, wine coolers, malt beverages, and sports and nutritional drinks.

Weighting agents are used to solve the problem of "ringing" in beverages. They are ingredients that bring the density of the citrus oils very close to that of water so that beverage mixtures remain stable.

The weighting agent, Sustane SAIB Food-Grade, is easy to handle and pours at room temperature; manufacturers have several options and greater convenience. Eastman Chemical Co. produces Sustane, which is 100% sucrose acetate isobutyrate manufactured by the controlled esterification of sucrose with acetic and isobutyric anhydrides. It has been used in other countries for many years and was approved as a GRAS food additive by FDA in June 1999. It also was approved in August 2002 for use in alcohol-containing beverages up to a maximum content of 300ppm.



Source: Eastman Chemical Company

In beverage manufacturing, the weighting agent is warmed to reduce its viscosity and then dissolves quickly when mixed with citrus flavor oils. Meanwhile, a water phase is prepared, which includes an emulsifier such as acacia gum or modified food starch, a preservative such as potassium sorbate or sodium benzoate, and an acidifier to balance beverage pH. The oil phase and the water phases are combined and homogenized under pressure until the particle size is 0.5-1 micron. The resulting beverage emulsion is stable and can be shipped or made into syrup by adding a small amount to water and a sweetener system. This syrup can be shipped or converted to the finished beverage by addition of water, and carbonated if desired. The weighting agent is present at less than 300ppm in the finished beverage.

"FDA allowed that maximum concentration because of the large amount of toxicological testing data in the GRAS petition supporting the safety of the product," says Phillip Cook, technical associate. "This is the highest concentration allowed for any weighting agent approved in the United States. The body treats SAIB as a carbohydrate, and it gradually breaks down into sucrose, acetic acid and isobutyric acid, all of which are naturally occurring and readily metabolized products," Cook explains.

SAIB-CO contains 10% orange terpenes. SAIB ET-10 contains 10% ethanol. CO's terpenes give it a subtle citrus flavor and aroma that blends very well with orange flavors. ET-10 can be used in soft drinks. The small amount of ethanol is considered a processing aid and contributes no flavor or aroma to the final beverage. However, a new blend without ethanol, and a neutral flavor and aroma, will be launched soon.

The viscosity of all the weighting agents are reduced when warmed.

A major advantage of the Sustane SAIB weighting agent is its stability to air oxidation, so no off-flavors develop during beverage storage. "Our analytical testing shows that it is also substantially hydrolytically stable and does not deteriorate in the beverage, and thus it has no effect on flavor or aroma," says Cook. pf

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