

Characterization of Sugar Beet Pectin in Relation to Emulsion Functionality

Jan A. Staunstrup and Claus Rolin

CP Kelco Aps

Ved Banen 16, DK-4623 Lille Skensved, Denmark

Summary

Sugar beet pectin may be used for stabilizing the citrus oil in carbonated soft drinks. The oil is usually blended with so-called weighting agents, of which there are several possible choices, and prepared as a 10-30% o/w emulsion. For making one litre of soft drink, typically 1 to 3 ml of the emulsion is used as an ingredient. In both systems, the oil should ideally be uniformly suspended and protected against oxidation. The emulsion further needs to be resistant to high-brix conditions that occur temporarily during the beverage preparation. Only few natural stabilizers like sugar beet pectin and gum arabic can satisfactorily withstand all of these conditions and stabilize the final beverage for several months.

This presentation describes a relationship between the content of acetyl ester groups in the pectin and its efficacy for stabilizing beverages relative to the chosen weighting agent and the sequence of conditions during the beverage manufacturing. It is speculated that the pectin reduces Ostwald ripening by creating a weakly gelled layer around the oil particles within which mass transportation is only by diffusion. This is in contrast to the bulk liquid within which external forces like vibration and temperature fluctuations, if they occur, can create larger-scale currents that adversely affect the stability.