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Application of Citric Acid and Citrates in Beverage Applications.

Introduction

One of the main functionalities of acidulants in beverages is to provide a good balance of flavour between the acid and sweeteners.

Food acids also help to extend shelf life by making the environment unfavourable for microbial growth. In addition, preservatives such as sodium benzoate and/or potassium Sorbate are more effective in acid systems. In wine applications acidulants are often needed to reduce the pH and enhance fermentation and flavour development.

Carbonated Beverages

Citric Acid, sodium citrate and potassium citrate have high solubility. This is important when adding concentrated syrups (containing sweeteners, acids, flavours and preservatives) to carbonated water.
The amount of acid and sugar varies from drink to drink. The more common levels for US Soft drinks are given in Table 1.

Table 1: Characteristics of common US soft drinks

Flavour	pH	Acid %	Brix°
Creaming Soda	4	0.0138	11.5
Cola	2.2	0.130* As 50% Phosphoric Acid	10
Ginger Ale Pale dry	2.7	0.131	9
Lemonade	3.4	0.107	10
Lemon-Lime	3.4	0.107	10
Orange Soda	3.3	0.139	14.5
Tonic water	2.5	0.350	9.5

Buffering agents such as Sodium citrate can be added to carbonated beverages to reduce or mask the tartness of the acid taste when the amount of acid is relatively large. However such a buffer may mask the flavour of some beverages, such as lemon-lime beverages. In Soda Water sodium citrate can add a cool, slightly saline taste and can aid in the retention of carbonation.

Fruit Drinks

Fruit drinks may contain varying quantities of juice and are supplemented with sugar and acid.
Typical Acid levels in various juices are given in Table 2

Table 2: Comparative Acidity of Fruit Juices

Type of Fruit Juice	Percentage Acid
Lemon	6.0
Orange	0.9
Lime	5.9
Grapefruit	1.0
Pineapple	0.6