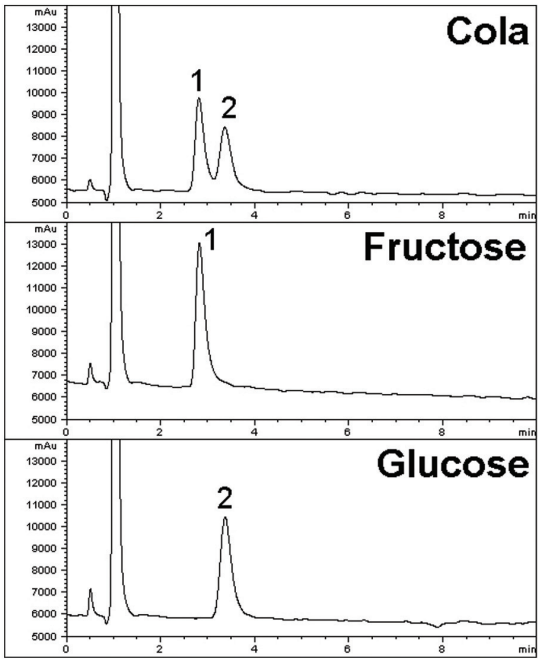
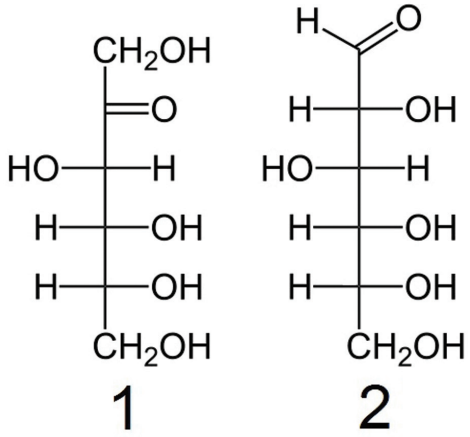
Fructose and Glucose in Coca-Cola®

Separation of polar sugars in soda beverage





Note: Coca-Cola was invented by John Pemberton, who was wounded in the Civil War and consequently became addicted to morphine. He devised a recipe called "Pemberton's French Wine Coca" that was intended as a medicinal agent and substitute for morphine. When laws were enacted that forced Pemberton to create a non-alcoholic version of the drink, the first formulation of Coca-Cola was born.

Method Conditions

Column: Cogent Amide™, 4µm, 100Å

Catalog No.: 40036-05P

Dimensions: 4.6 x 50 mm

Mobile Phase: 5% DI H_2O / 95% acetonitrile (v/v), with 15 min preconditioning of 10% DI H_2O / 90% acetonitrile / 0.1% triethylamine (TEA) (v/v)

Injection vol.: 1µL

Flow rate: 1.0mL/min

Detection: Refractive Index

Sample: Coca-Cola soda sample was filtered (0.45µm, nylon) and diluted 1:5 with a diluent of 50/50 acetonitrile / DI H_2O.

Peaks: 1. D-Fructose
2. D-Glucose

t_0: 0.8 min

Discussion

The high sugar content of soda beverages can be observed in this chromatographic separation of fructose and glucose in cola. The two sugars are retained and separated with the use of the Cogent Amide column. Data from reference standards is also shown for peak identity confirmation.

A preconditioning protocol with a TEA-based mobile phase was found to improve the peak shape of fructose. Refractive index is an ideal choice for this application because the sugars are UV-transparent and their concentrations are high enough (even with a 5X dilution) to be easily observed with a relatively insensitive detector such as this.

The large peak at the solvent front is characteristic of RI detection when the sample diluent differs from the mobile phase. In this case, a diluent with higher water content than the mobile phase was chosen for the purpose of analyte solubility.

MANUFACTURED BY:
MICROSOLV TECHNOLOGY CORPORATION
9158 Industrial Blvd NE
Leland, NC 28451
p: 1.732.380.8900
f: 1.910.769.9435
customers@mtc-usa.com
www.Cogent-HPLC.com