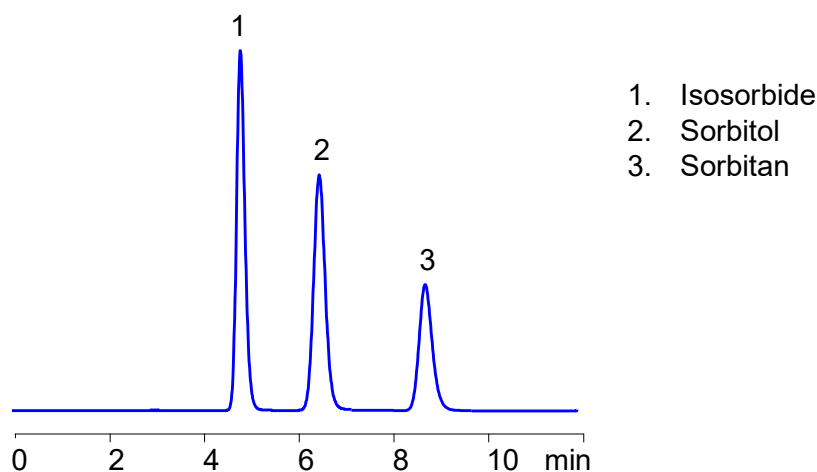


HPLC Separation of Isosorbide, Sorbitol and Sorbitan on Amaze HD Column



Column: Amaze HD
Dimensions: 4.6x250 mm., 5 μ m, 100A
Mobile phase: 75% ACN with 50 mM AmFm pH 3
Flow rate: 1 ml/min
Detection: ELSD/CAD/MS

Application Notes

This HPLC method describes the separation of Isosorbide, Sorbitol, and Sorbitan using the Amaze HD mixed-mode column. The **Amaze HD** stationary phase is a tri-modal HILIC mixed-mode phase that combines hydrophilic interaction (HILIC), cation-exchange, and anion-exclusion mechanisms. It features a short hydrophilic ligand with an acidic ionizable group ($pK_a \approx 3$), enabling strong interactions with polar compounds while maintaining excellent control of retention and selectivity through mobile phase composition.

The HILIC mechanism dominates under high acetonitrile conditions, where analytes partition between the water-enriched stationary phase and the bulk mobile phase. Retention through HILIC can be modulated by changing the acetonitrile-to-water ratio and buffer concentration - higher organic content increases retention of hydrophilic compounds, while higher buffer concentration reduces it. Isosorbide, Sorbitol, and Sorbitan are structurally related polyols derived from glucose reduction and dehydration. Sorbitol is a hexitol alcohol widely used as a humectant and excipient. Sorbitan is a partially dehydrated derivative of sorbitol, acting as an intermediate in surfactant production. Isosorbide, the doubly dehydrated form, is used as a pharmaceutical excipient and monomer for biopolymers. Although these compounds differ only by the number and arrangement of hydroxyl and ether groups, their polarity and hydrogen-bonding capacity vary significantly, making chromatographic separation challenging.

On the **Amaze HD** column, the combination of strong, adjustable HILIC retention and the surface's acidic ion-exclusion properties enables baseline separation of these neutral polyols. Differences in hydrophilicity and molecular structure translate into distinct retention behavior, providing excellent peak shape, reproducibility, and selectivity - ideal for quality control and compositional analysis of carbohydrate and polyol mixtures.