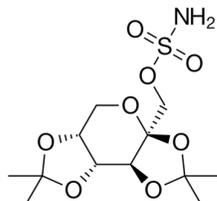


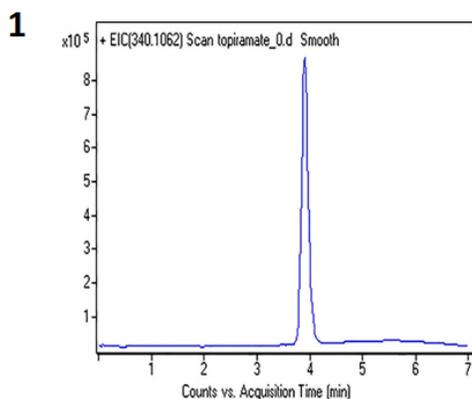
Topiramate

Retention of a sulfonate drug using the Cogent BDC18



Topiramate

Formula C₁₂H₂₁NO₈S
Molar mass 339.363 g/mol g·mol⁻¹



Notes: Migraines are a common, disabling neurological disorder and are often accompanied by one or more of the following disabling symptoms: visual disturbances, nausea, vomiting, dizziness, extreme sensitivity to sound, light, touch and smell, and tingling or numbness in the extremities or face. Migraines involve a complex interchange between various brain regions, including the hypothalamus and brainstem nuclei that modulate pain signaling. The headache phase involves activation of the trigeminovascular system. Topiramate modulates the trigeminovascular signaling that is effective in migraine prevention. It is also used as an antiepileptic drug (AED) and is structurally distinct from other AEDs as it is derived from D-fructose, a naturally occurring sugar moiety, and has sulfamate functionality.

Method Conditions

Column: Cogent Bidentate C18™, 4µm, 100Å

Catalog No.: 40018 -05P-2

Dimensions: 2.1 x 50 mm

Solvents: A: DI H₂O/ 0.1% Formic Acid

B: Acetonitrile/ 0.1% Formic Acid

| Gradient: | time (min.) | %B |
|-----------|-------------|----|
| | 0 | 10 |
| | 1 | 10 |
| | 4 | 90 |
| | 5 | 90 |
| | 6 | 10 |
| | 7 | 10 |

Injection vol.: 1µL

Flow rate: 0.3 mL/min

Detection: ESI - pos - Agilent 6210 MSD TOF mass spectrometer

Sample: Topiramate. Final concentration: 0.01 mg/mL in 50%A/50%B solvent mixture.

Fig. 1: Topiramate on Bidentate C18 using RP

Discussion

Topiramate is a prescription drug used as a preventative for migraine headaches and decrease the occurrence of migraines. The structure of Topiramate leads us to think due to the amino group and negative Log P value of -0.8, the optimal column of choice would be the Cogent Diamond Hydride™ to retain this hydrophilic, polar compound. In a surprising outcome, the compound was not able to be retained on the Diamond Hydride™, even when using a 4.6 x 100mm column. Excellent retention was observed when a 4.6 x 50mm Cogent Bidentate C18™ column was used in analysis of this drug. This hydrophilic compound retention is another example of the unique properties of the Bidentate C18™. MS detection was used in order to eliminate derivatization step for UV absorption.