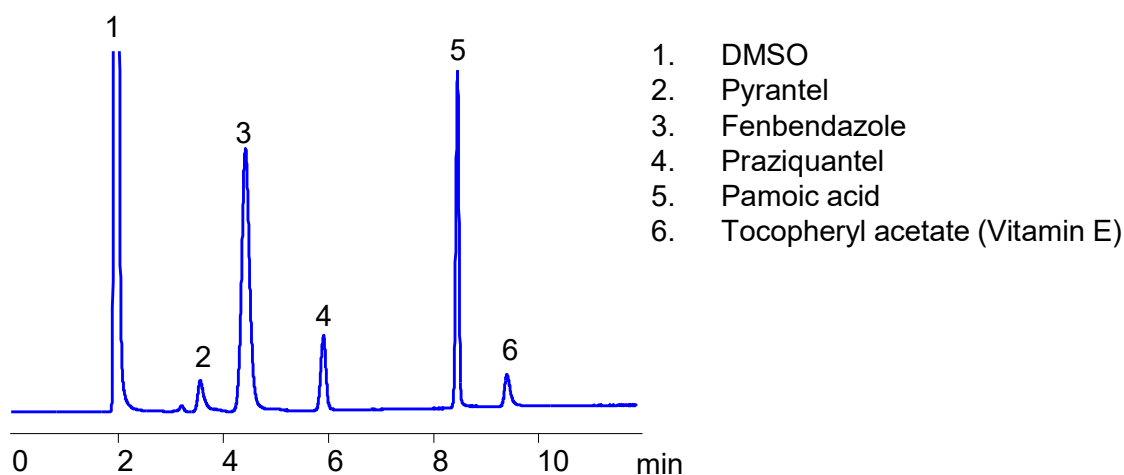


HPLC Analysis of Veterinarian Drug Composition on Amaze TH Mixed-Mode Column



Column: Amaze TH
Dimensions: 4.6x150 mm, 3 μ m, 100A
Mobile phase: ACN/Water/H₂SO₄ double gradient
Flow : 1 ml/min
Detection: 215 nm

Application Notes

A UV-detected HPLC method was developed for the simultaneous determination of six components commonly used in veterinary formulations - DMSO, pyrantel, fenbendazole, praziquantel, pamoic acid, and tocopheryl acetate (vitamin E) - using the **Amaze TH mixed-mode column**. These substances represent a diverse combination of solvents, antiparasitic agents, organic acids, and fat-soluble vitamins, covering a wide polarity and ionization spectrum that challenges conventional reversed-phase chromatography.

Biologically, pyrantel and praziquantel are broad-spectrum anthelmintics effective against nematodes and cestodes, while fenbendazole acts by inhibiting microtubule polymerization in parasites. Pamoic acid is used to form stable salt complexes with pyrantel, improving bioavailability and reducing volatility. Tocopheryl acetate, a stable ester of vitamin E, provides antioxidant protection in tissue and supports recovery following antiparasitic therapy. DMSO, a polar aprotic solvent, enhances drug solubility and penetration through biological membranes, aiding formulation uniformity and absorption.

The **Amaze TH** stationary phase is a multi-modal HILIC mixed-mode material featuring HILIC, weak reversed-phase, cation-exchange, and anion-exchange properties. It contains acidic ($pK_a \approx 3$) and basic ($pK_a \approx 10$) functional groups separated by a long hydrophilic linker, enabling balanced retention through hydrophilic partitioning, electrostatic attraction, hydrogen bonding, and mild hydrophobic effects.

Separations were performed using a double-gradient ACN/water/H₂SO₄ system, allowing independent adjustment of organic strength and ionic environment. UV detection ensured reliable quantitation across all analytes. The method achieved complete baseline resolution, with elution order reflecting charge, polarity, and hydrophobic surface area.

This study demonstrates the **Amaze TH** mixed-mode column as a powerful tool for analyzing multi-class veterinary drug formulations, offering broad selectivity, reproducibility, and robustness for complex pharmaceutical mixtures.