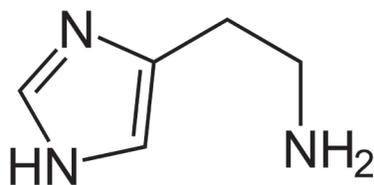
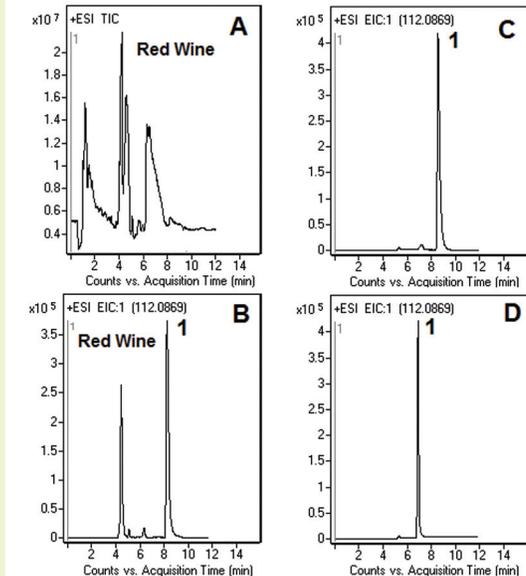


Histamine in Red Wine

LC-MS method without derivatization



Note: Histamine is known for its role in allergic response. Release of histamine plays a role in inflammation, gastric acid secretion, microcirculation and neurotransmission in mammalian brains. Measurement of histamine levels in body fluids has been used in clinical analysis in various diseases such as preeclampsia, asthma, cancer, mastocytosis and in the progression of periodontitis. Histamine is also present in many foods and beverages, especially red wine and spoiled food. Ingesting histamine can cause migraines, sweating and nausea.

Method Conditions

Column: Cogent Diamond Hydride™, 4µm, 100Å

Catalog No.: 70000-15P-2

Dimensions: 2.1 x 150 mm

Solvents: A: 50% DI H₂O / 50% 2-propanol / 0.1% formic acid

(Figures A-C)

DI H₂O / 0.1% formic acid (Figure D)

B: Acetonitrile / 0.1% formic acid (All Figures)

Gradient:	time (min.)	%B
	0	80
	5	10
	7	10
	8	80

Post Time: 5 min (can be reduced for standards)

Injection vol.: 1µL

Flow rate: 0.4 mL/min

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

Figures: A. Old red wine, TIC.

B. Old red wine, EIC (112.0869 m/z). Extra peak is likely an isomer of histamine

C. Histamine dihydrochloride standard, EIC (112.0869 m/z). 50% isopropanol in solvent A

D. Histamine dihydrochloride standard, EIC (112.0869 m/z). No isopropanol in solvent A

Sample: Old Red Wine: Sample was filtered with 0.45µm nylon syringe filter (MicroSolv Tech Corp.) and diluted 1:5 with 50:50 solvent A:B mixture.

Standard: 1 mg/mL histamine dihydrochloride stock solution in 80/20 DI H₂O / MeOH diluted 1:100 with 50/50 solvent A / solvent B diluent.

Peak: 1. Histamine (112.0869 m/z)

t₀: 0.9 min

Discussion

This method for red wine analysis is simple, fast, robust and does not require derivatization like many other HPLC methods. When isopropanol was not used in the A solvent, the histamine peak was highly symmetrical in the standard (Compare Fig. C and D) but distorted in the red wine extract due to matrix effects. Addition of 50% of isopropanol to solvent A greatly improved peak shape for analysis of wine samples (Fig. B). Please note that histamine retention increased when isopropanol was in solvent A, since DI H₂O is the strongest solvent and substituting it for isopropanol reduces eluting power of the mobile phase.

APP-A-160