

Ultra High-Speed Analysis of Cold and Sinus Medicines by Ultra High-performance Liquid Chromatography with Photodiode Array

Introduction

Acetaminophen (Paracetamol), anhydrous caffeine, hesperidin, ethenzamide, tipepidine hibenzate or apronalide etc. are known as active ingredients of cold or sinus medicines. Acetaminophen has antipyretic and analgesic effects. Anhydrous caffeine increases the analgesic effect. Hesperidin improves blood circulation and has an antiallergenic effect. Ethenzamide has antipyretic, analgesic and antiphlogistic effects. Tipepidine hibenzate has antitussive and expectorant effects. Apronalide has analgesic and hypnotic effects.

The active ingredients contained in cold and sinus medicines were analyzed by UHPLC with PDA detection, which enables ultra-high speed data acquisition at the rate of 100 spectra/sec.

Keyword: UHPLC, Acetaminophen, Anhydrous Caffeine, Hesperidin, Ethenzamide, Tipepidine, hibenzate, Apronalide, 1.8 μm , PDA Detector



JASCO X-LC system

Experimental Equipment:

Pump:	X-LC 3185PU x 2
Degasser:	X-LC 3080DG
Mixer:	X-LC 3180MX
Column oven:	X-LC 3067CO
Autosampler:	X-LC 3159AS
Detector:	X-LC 3110MD

Conditions:

Column:	ZORBAX SB-C18 (3.0 mmID x 50 mmL, 1.8 μ m)
Eluent:	A; 0.1% Phosphoric acid, B; Acetonitrile
Gradient condition:	((A/B), 0 min(20/80), 1.4 min(50/50), 2.0min(50/50), 2.05 min(20/80) 1 cycle; 4.5 min
Flow rate:	0.8 mL/min
Column temp.:	40°C
Wavelength:	200-400 nm
Injection volume:	1 μ L
Standard sample:	Acetaminophen, Caffeine, Phenol (I.S.), Ethenzamide, Hesperidin, Tipepidine Hibenzate 0.02mg/mL each, Apronalide 0.1mg/mL

Results

Figure 1 shows the chromatogram and contour plot of active ingredients contained in a cold and sinus medicine. Seven active ingredients and phenol added as internal standard(I.S.) are clearly separated within 1.5 min.

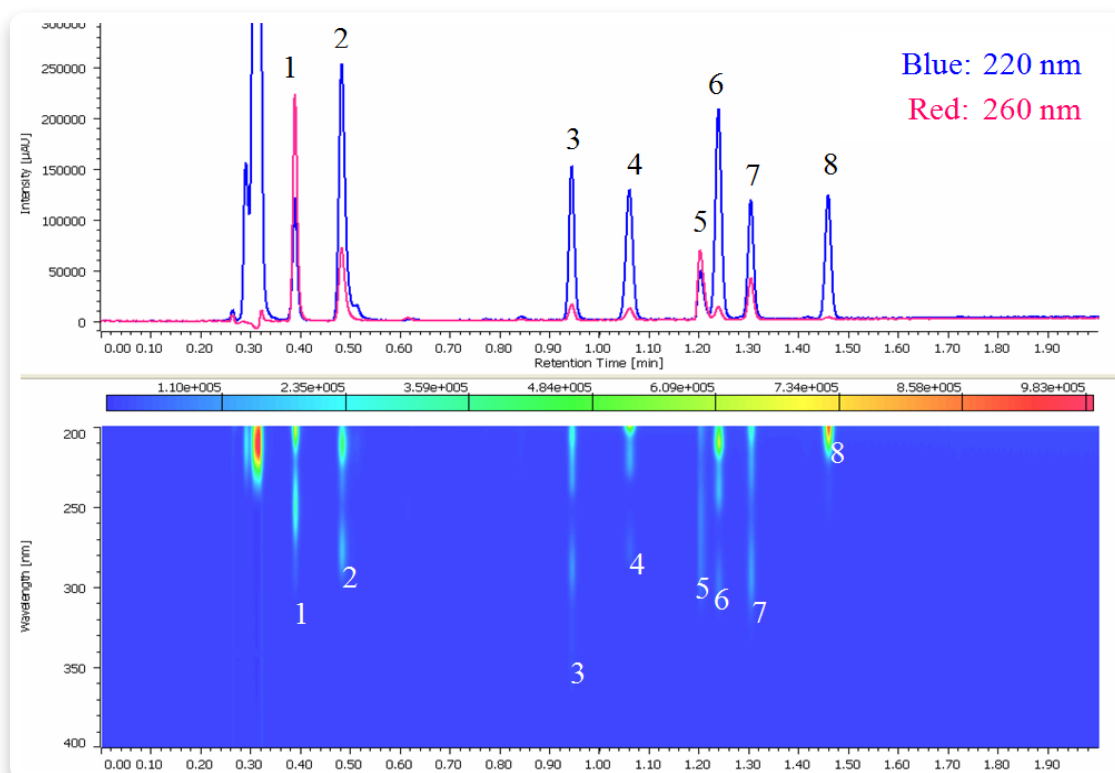


Figure 1. Chromatogram of the Active Ingredients contained in Cold and Sinus medicines. 1: Acetaminophen, 2: Caffeine, 3: Hesperidin, 4: Phenol (I.S.), 5: Hibenzic acid, 6: Ethenzamide, 7: Tipepidine, 8: Apronalide.

Figure 2 shows the on peak spectra of active ingredients contained in a cold and sinus medicine. Good spectrum was obtained for each component.

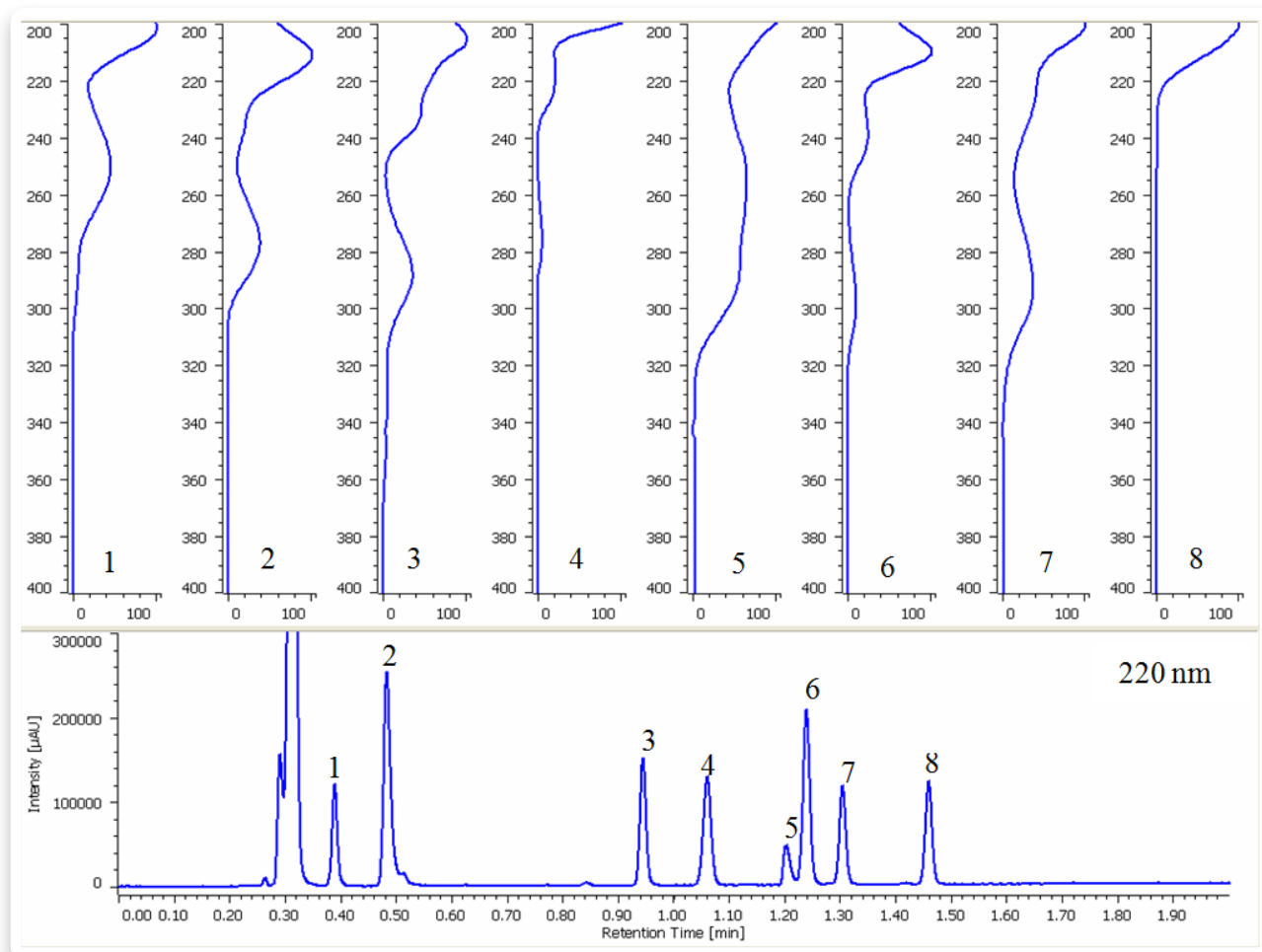


Figure 2. On peak Spectra of the Active Ingredients contained in a cold and sinus medicine. 1: Acetaminophen, 2: Caffeine, 3: Hesperidin, 4: Phenol (I.S.), 5: Hibenzic acid, 6: Ethenzamide, 7: Tipepidine, 8: Apronalide.