

Analysis of Colorants by HPLC-PDA

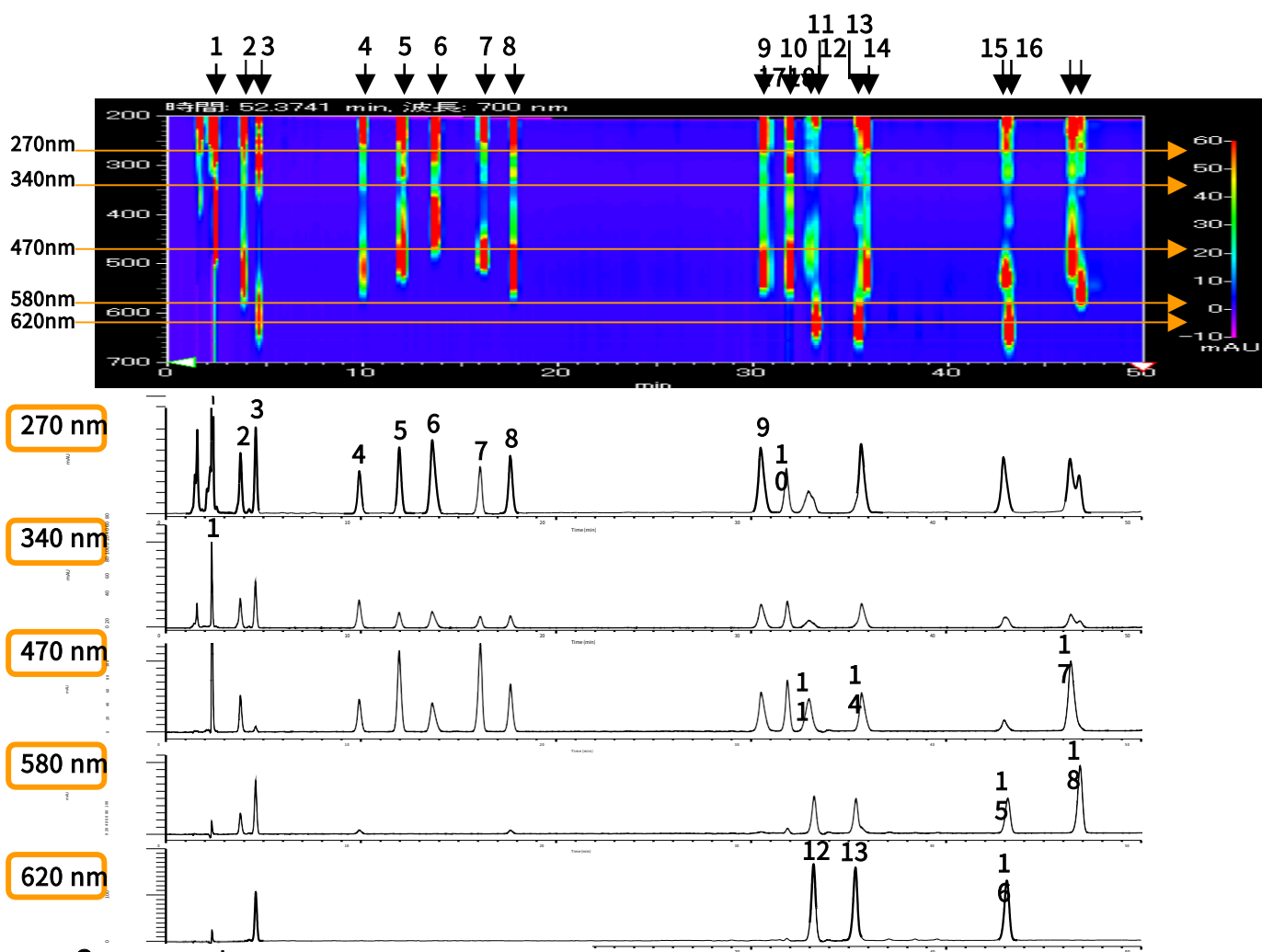
Artificial colorants are widely used because of their low prices and useful chemical properties. For example, as compared with natural food dyes, many artificial colorants are more stable to heat, light, and oxygen. This feature is advantageous in quality control of the colorants. However, it has been pointed out that their excess or combinational use may cause toxic effect. In this note, a simultaneous determination method for 18 artificial colorants using PDA (photo-diode array) detector is described.

Conditions

Column : Inertsil ODS-3 (5 μ m, 150 x 4.6 mm I.D.
Cat.No. 5020-01731
Eluent : A) CH₃CN, B) 10 mM Na₂HPO₄ (pH 6.9)
A/B = 10/90 – 50 min – 35/65
Flow rate : 1.0 mL/min
Col. Temp. : 40 °C
Detector : PDA
Injection Vol. : 10 μ L

PDA detector is highly recommended for simultaneous determination of various compounds. Even if multiple peaks are detected at same retention time by monitoring with a certain wavelength, it may be possible to detect each compound as a single peak by detecting at other wavelengths.

The chromatogram shown below is an example. Peak 17 and peak 18 were not separated at wavelength of 270 nm. However, with shifting the wavelength to 470 nm peak 17 was obtained as single peak, and peak 18 also can be determined by detection at 580 nm.



Components

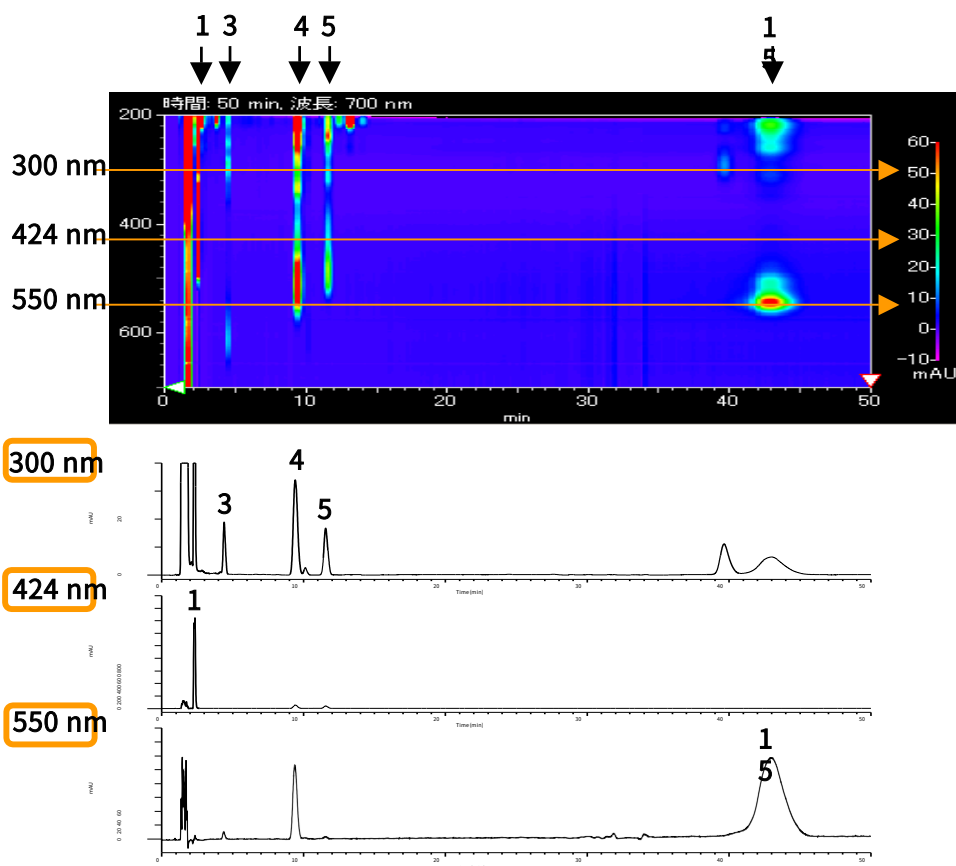
Red numbers : dyes not permitted as food additives by the Food Sanitation Law of Japan

1. Tartrazine (FD&C Yellow No.5, Acid Yellow 23)	7.6mg/L	10. Ponceau SX (FD&C Red No.4, Scarlet GN)	5.3 mg/L
2. Amaranth (FD&C Red No.2, Acid Red 27)	3.8mg/L	11. Orange I (Ext. D&C Orange No.3, Acid Orange 20)	5.3 mg/L
3. Indigo Carmine (FD&C Blue No.2, Acid Blue W)	7.6mg/L	12. Fast Green FCF (FD&C Green No.3, Solid Green FCF)	
4. Ponceau 4R (Acid Red 18)	3.8mg/L	13. Brilliant Blue FCF (FD&C Blue No.1, Acid Blue 9)	3.0 mg/L
5. Sunset Yellow FCF (FD&C Yellow No. 6, Orange Yellow S)	5.3 mg/L	14. Ponceau 3R (FD&C Red No.1)	3.0mg/L
6. Naphthol Yellow S	7.6 mg/L	15. Erythrosine (FD&C Red No.3, Acid Red 51)	7.6mg/L
7. Uranine (D&C Yellow No.8, Fluorescein Sodium Salt)	3.8mg/L	16. Azure Blue VX (Acid Blue 1, Patent Blue V)	5.3mg/L
8. Allura Red AC (FD&C Red No.40)	5.3mg/L	17. Orange II (D&C Orange No.4, Acid Orange 7)	3.0mg/L
9. Ponceau R (D&C Red No.5, Acid Red 26)	7.6mg/L	18. Sulforhodamine B (Acid Red 52)	7.6mg/L
			3.0mg/L

Analysis of Powdered Soft Drink (powdered coke)

Pretreatment Procedure

- Powdered coke 10 g
-
- Dissolution
- 10 mL Water
- Filtration
- Membrane filter (0.45µm)
- HPLC



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