Analytical method of sudan red in food

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Experimental background

Sudan stain is a group of dyes, but not a food additive. Its chemical composition contains naphthalene, which has an azo structure. It is carcinogenic, having significant toxic effect to the liver and kidney, due to the nature of its chemical structure. Many countries have banned it from being added as a coloring agent in food.

This method refers to the "GB/T 19681-2005 analytical method of Sudan Red in food using high-performance liquid chromatography". The sample was prepared by solvent extraction and purified by solid phase extraction column. HPLC-UV detector was used for analysis with external reference method. The method is simple, fast, accurate and practical.

Experimental

Column: SVEA C18 Gold 5µm 110Å 4.6*250mm

Instrument: HPLC

Mobile phase: Acetonitrile:water=95:5(v:v)

Flow rate: 1.0 mL/min

Column temperature: 35 °C

Detector:
Sudan I UV 478 nm
Sudan II UV 520 nm
Sudan III UV 520 nm
Sudan IV UV 520 nm

Extractant: Acetonitrile

Injection volume: 10µL

Analyte:
Sudan I 100 µg/mL
Sudan II 100 µg/mL
Sudan III 100 µg/mL
Sudan IV 100 µg/mL

Chromatogram

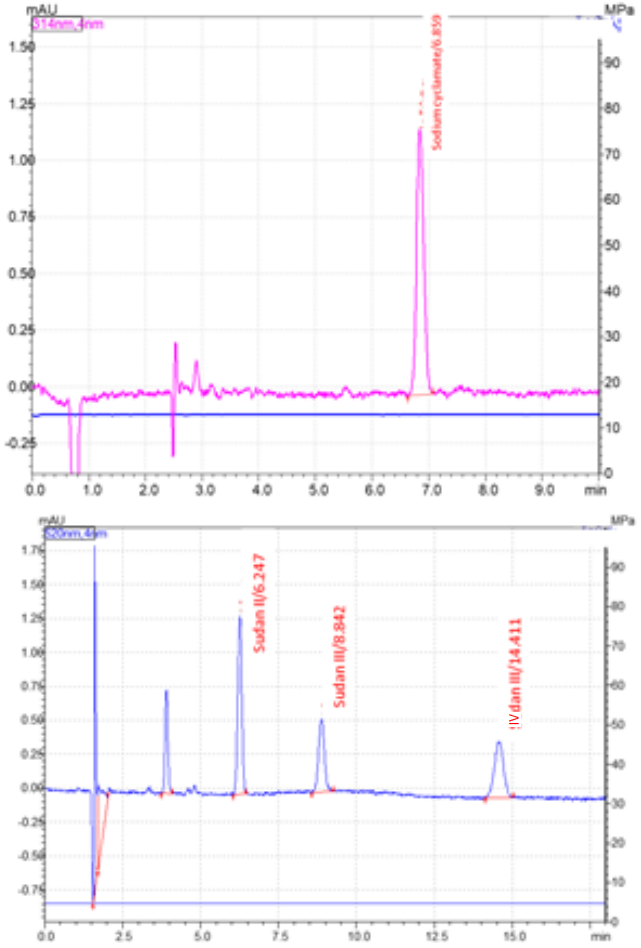

Figure 1: Standard chromatogram of Sudan stains. Peaks in elution order: Sudan I, Sudan II, Sudan III, and Sudan IV.

Results

ID#	Analyte	Retention time (min)	AUC	Peak height	Concentration (µg/mL)
1	Sudan I	3.921	96376	14199	100
2	Sudan II	6.247	108316	11882	100
3	Sudan III	8.842	112008	8827	100
4	Sudan IV	14.411	197665	10048	100

Conclusion

This method uses SVEA C18 Gold 5µm 110Å 250x4.6mm HPLC column to analyze Sudan stains. The analysis of four Sudan stains takes only 15 mins, showing good separations with good peak shapes and good linearity, which fully meet the quantitative requirements.

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