



Application FTIR spectroscopy for identifying synthetic azodyes

Shestopalova N. B., Fomina Yu. A.

Saratov State Medical University named after V. I. Razumovsky

e-mail: shestopalovanb@yandex.ru

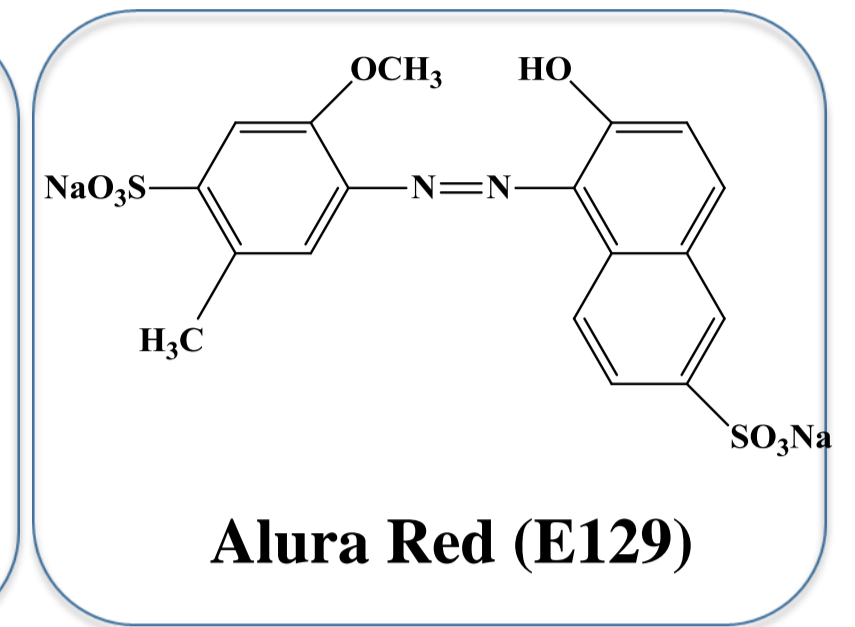
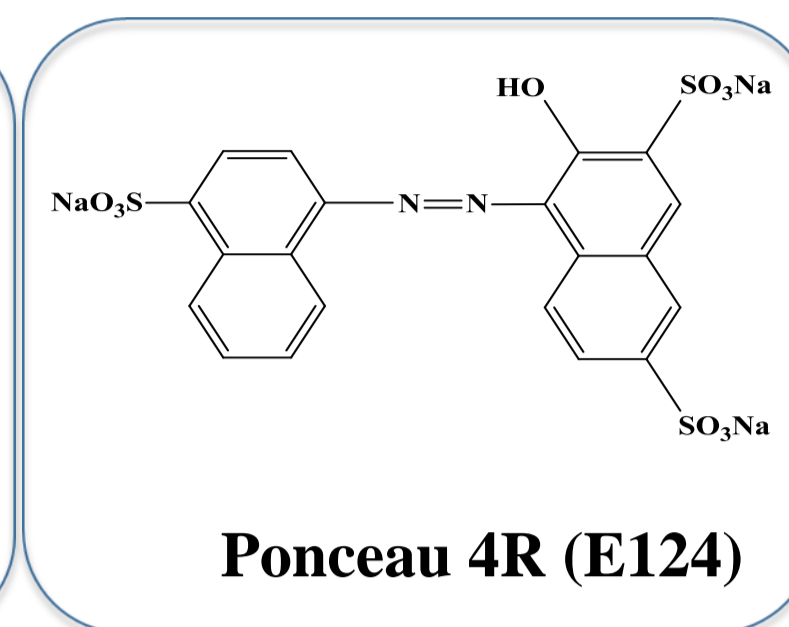
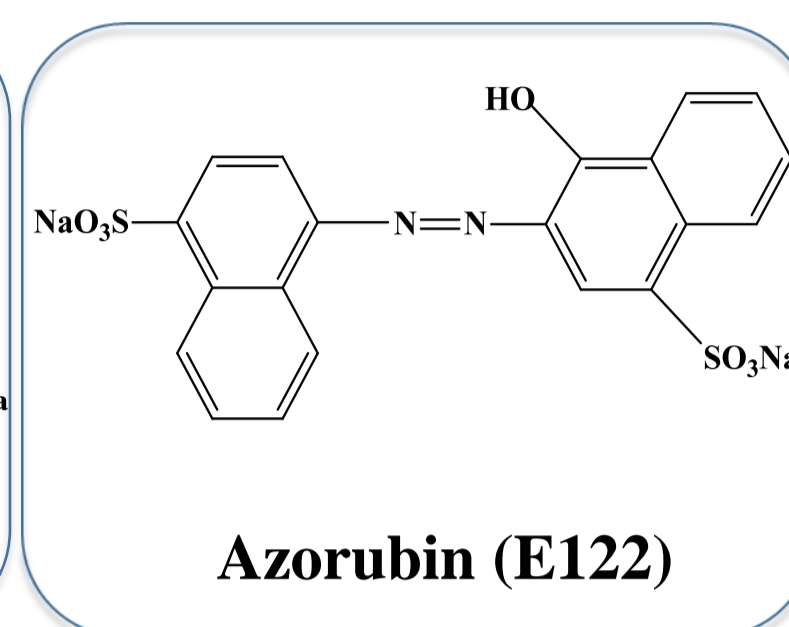
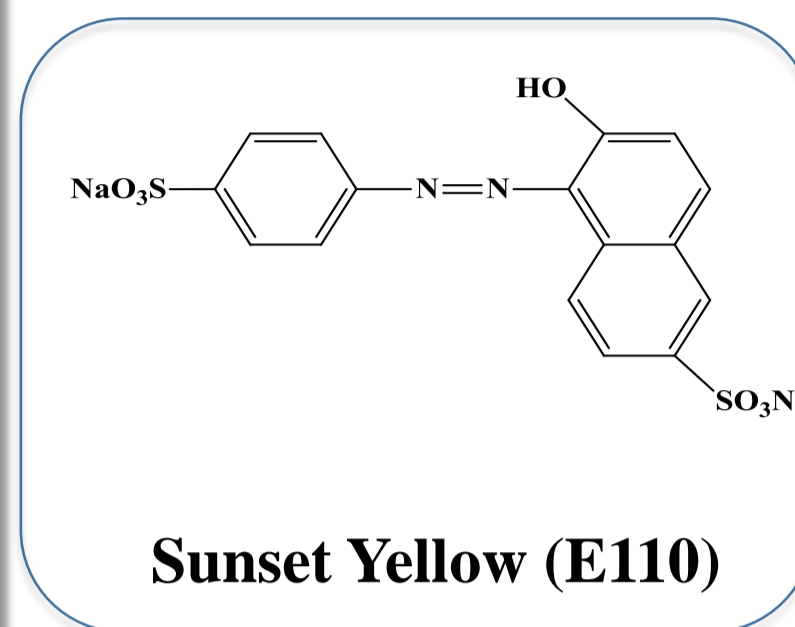
The aim of the work: to assess the possibility of using FTIR spectroscopy for the identification of synthetic food sulfoazo dyes, similar in chemical structure.

The identification of synthetic dyes in various objects (food products, pharmaceuticals, cosmetics, etc.) is an urgent problem.

The greatest danger to humans is represented by compounds containing various aromatic fragments in their structure, as well as an azo group, which is reduced to toxic amines under the action of intestinal microflora.

Research objects

Synthetic food colors - food colors obtained by chemical synthesis methods



Experimental

FTIR spectroscopy is one of the modern and reliable methods for establishing the structure of organic compounds.

The IR spectrum was recorded using a IRAffinity-1 SHIMADZU (Japan) FT-IR spectrometer in the region 400-4000 cm^{-1} with the standard KBr technique with 1 mg of sample per 300 mg of KBr.

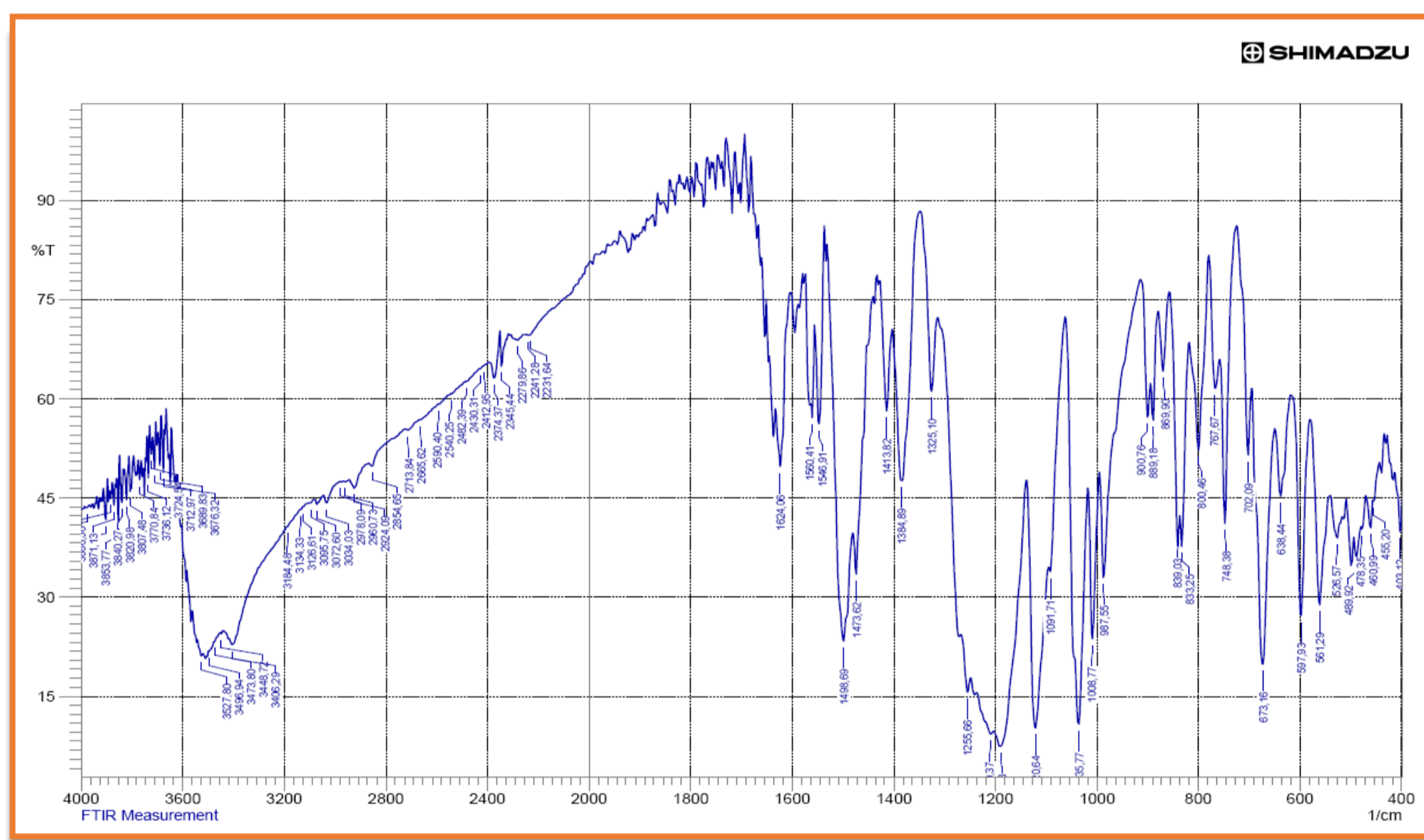
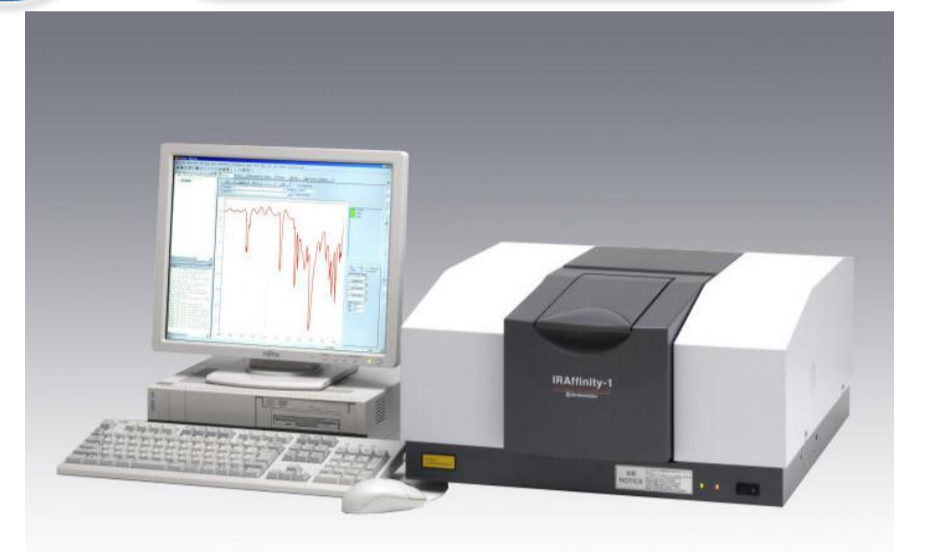


Fig.1 The FTIR spectrum of Sunset yellow in the wave number range 4000-400 cm^{-1}

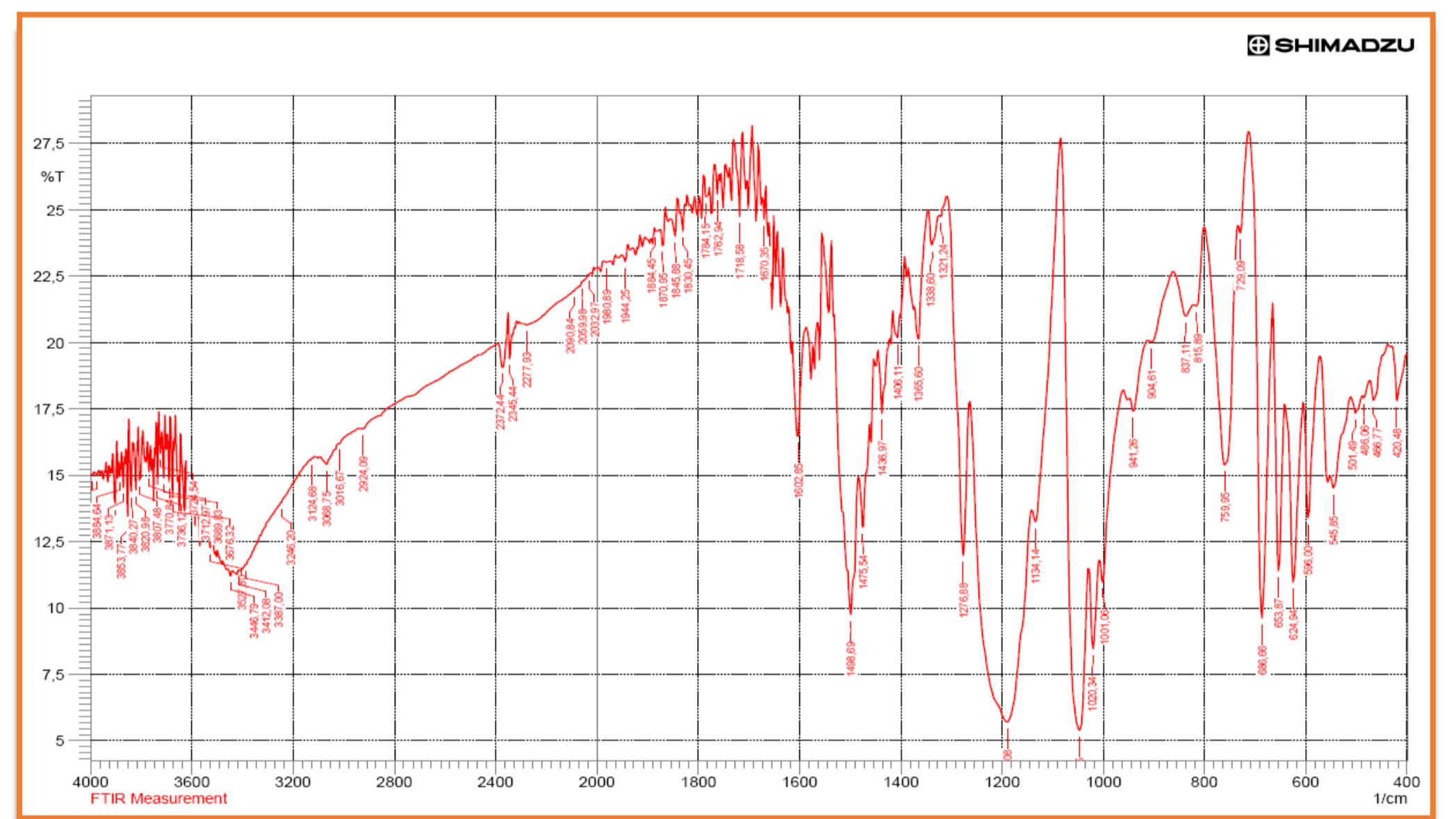


Fig.2 The FTIR spectrum of Azorubin in the wave number range 4000-400 cm^{-1}

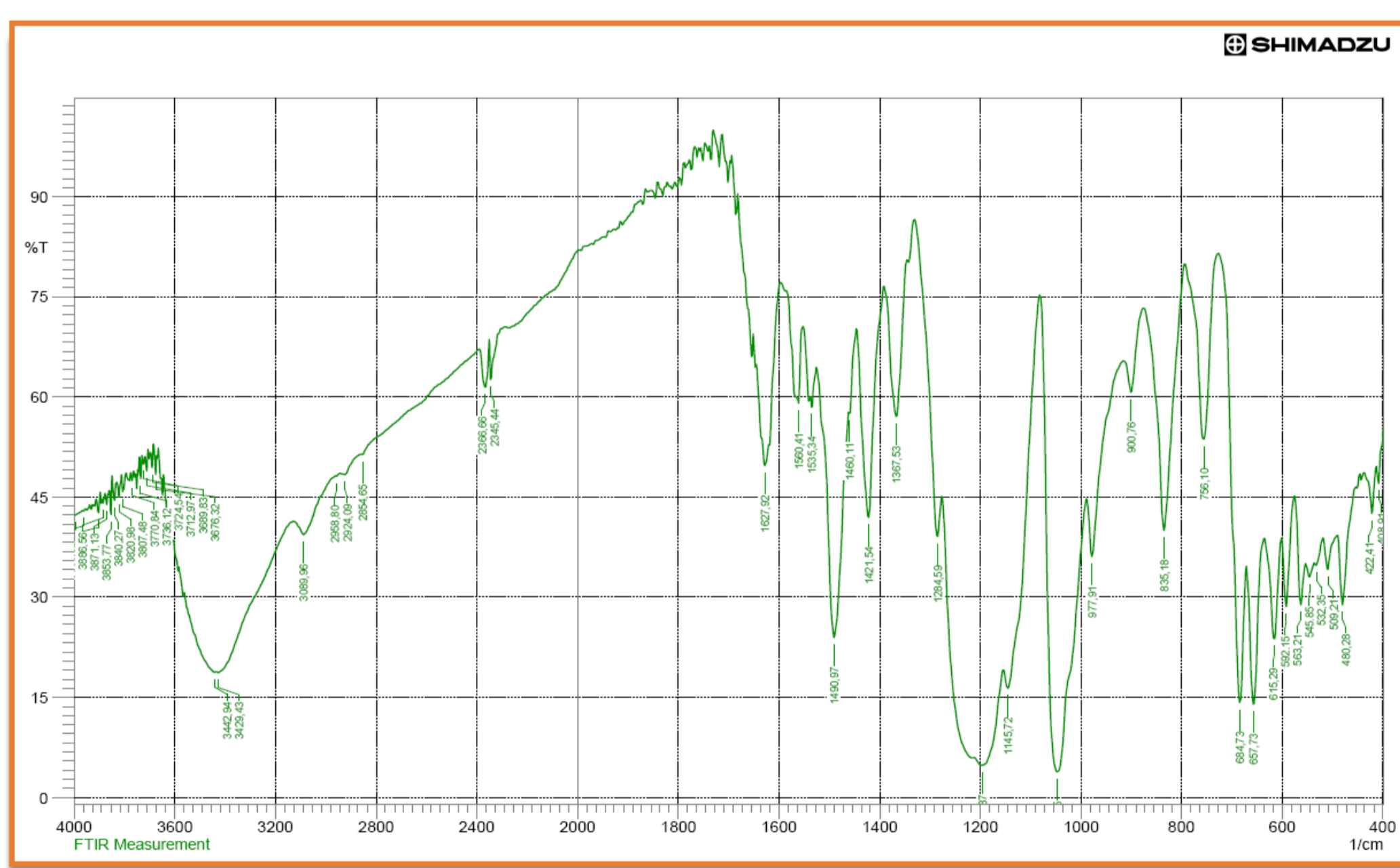


Fig.3 The FTIR spectrum of Ponceau in the wave number range 4000-400 cm^{-1}

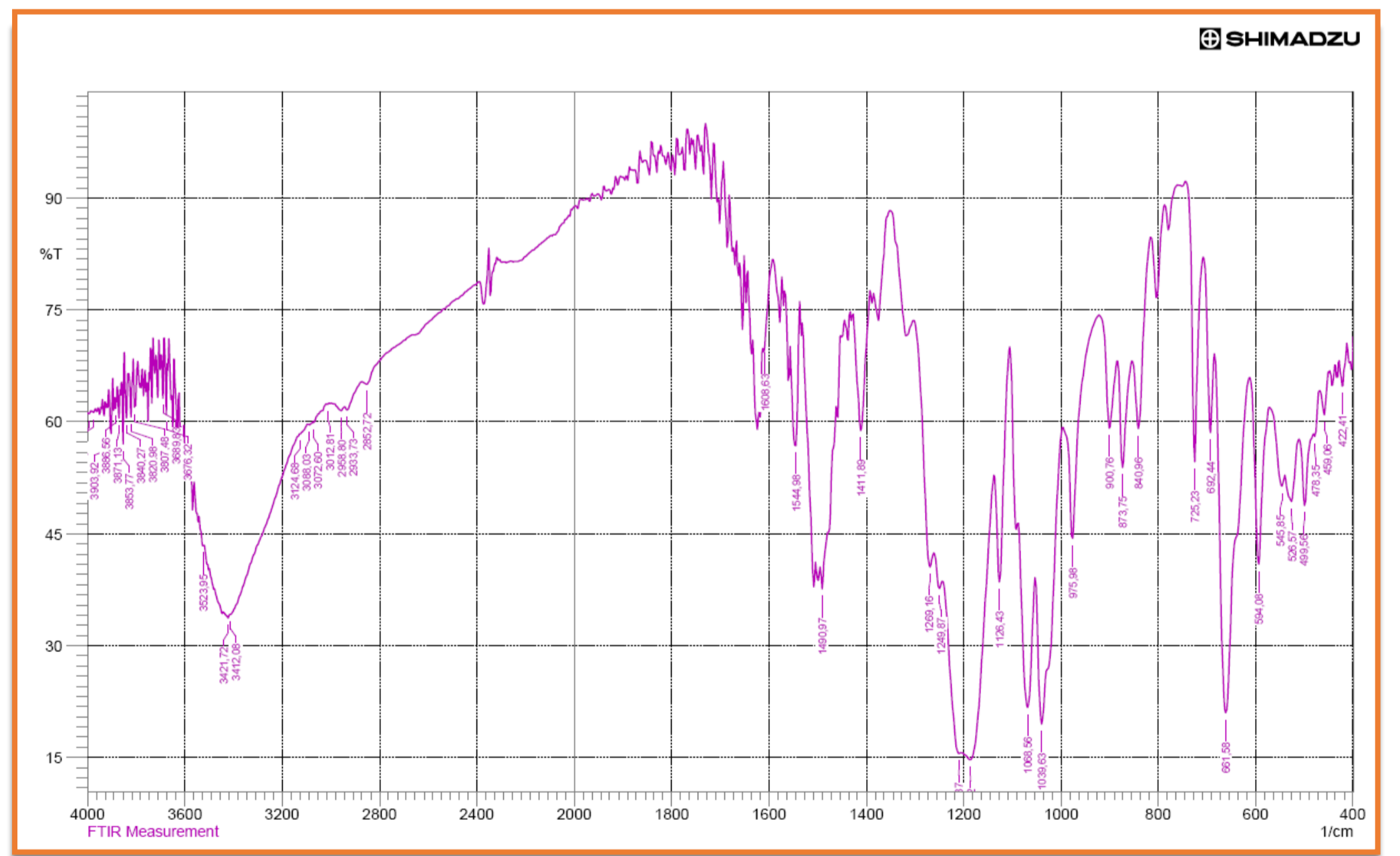


Fig.4 The FTIR spectrum of Allure red in the wave number range 4000-400 cm^{-1}

CONCLUSIONS

- ❖ The IR spectra of the studied compounds contain a set of absorption bands corresponding to aromatic rings, hydroxyl, azo- and sulfo- groups.
- ❖ The difference in the structures of E110 and E129 was reflected in the IR spectra by the presence of bands characteristic of the methyl and oxymethyl groups.
- ❖ The greatest differences in the IR spectra of E122 and E124 were recorded in the area of "fingerprints".

Vibrational assignments	Experimental FTIR, cm^{-1}			
	E 110	E 122	E 124	E 129
OH ν	3448	3442	3433	3429
OH $\delta_{\text{плоск}}$	1560	1571	1560	1544
OH $\delta_{\text{внеплоск}}$	839	835	837	840
C-O ν	1029	1020	1020	1029
arC-H ν	3034	3089	3070	3034
arC-H δ	1473	1604	1627	1475
	1498	1498	1490	1500
	1624			1624
C-C $\delta_{\text{внеплоск}}$	800	835	837	833
N=N ν (малоинтенсивная)	1411	1437	1421	1411
SO ₂ ν as	1190	1190	1195	1186
	1037	1047	1047	1039
CH ₃ ν as	2958	2958	2958	2958
CH ₃ ν sy	2852	2852	2854	2852