



Synthesis of Gossipy Products of Pyrimidine Bases and Getting Their Water-Solved Complexes

Khakberdiev Shukhrat Mahramovich

Associate Professor Jizzakh Polytechnic Institute
Email: h.shyxrat81@gmail.com

Karimova Feruza Sattarovna Mamatova Farangiz

Freelance researcher Email: h.shyxrat81@gmail.com

Student Jizzakh Polytechnic Institute
Email: h.shyxrat81@gmail.com

ABSTRACT

Gossypol itself and its derivatives are currently used in medical practice as a means against viral diseases, as they have a wide range of physiological activity. Schiff bases with heterocyclic amino compounds of gossypol, and water-soluble supramolecular complexes were obtained and their structure was studied using the IR, -UB, and -PMR spectra.

Keywords:

Gossypol, heterocyclic, 2-aminopyrimidine, 2-amino-4,6-dimethyl pyrimidine, 2-amino-4-methyl-5-Bromo-6-hydroxypyrimidine, spectrum, complex, reaction.

Today, new types of infectious diseases, viruses, and bacteria are emerging. At the same time, the synthesis of new biologically active substances with high sensitivity to such viruses and bacteria with interferon-inducing properties and their application in practice remains one of the main and urgent problems. One of the first low molecular weight inducers of interferon is gossypol. Derivatives of gossypol with primary amines of various structures have been found to have higher physiological activity than gossypol [1-2].

Gossypol has a complex structure and reacts with two aldehyde groups of primary amines in a ratio of 1: 2 mol to form Schiff bases.

The bond formed between these two molecules is called the azomethine bond [3-4].

InToynthesize highly biologically active substances, new Schiff bases were synthesized with gossypol with heterocyclic compounds such as 2-aminopyrimidine, 2-amino-4,6-dimethyl pyrimidine, 2-amino-4-methyl-5-bromine-6-hydroxypyrimidine [5 -6]. The reaction was carried out for three hours in a refrigerator, in a magnetic stirrer, heated to 70 ° -80 ° C. The reaction was checked every half hour using a thin-layer chromatography method. Some physicochemical constants of the obtained substances were determined.

The reaction was carried out according to the following scheme:

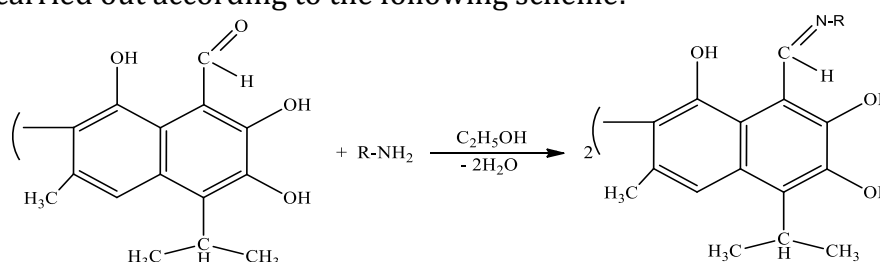
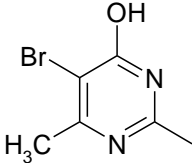
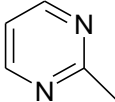
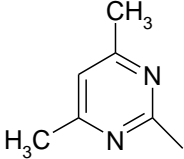


Table 1
Some physicochemical constants of synthesized new compounds

No	Association	Radical - R	T _{liquid} , °S	Rf			Unum, % da	pH	Rangi
				1	2	3			
1	I		215-17	0.57	0.7	0.76	77.5	8.7	the red is red
2	II		205-07	0.50	0.67	0.57	73.78	8.8	yellow
3	III		228-29	0.51	0.74	0.69	72.4	7.8	light yellow

Systems: ¹ Hexane - acetone (3: 2,5); ² Benzene - Acetone (5: 1,5) ³ Benzene - Alcohol (3: 1)

The derivative of gossypol with 2-aminopyridine is well soluble in benzene, diethyl ether, poorly soluble in alcohol, acetone, chloroform, and hexane; the derivative of gossypol with 2-amino-4-methyl-5-bromo-6-hydroxypyrimidine was found to be poorly soluble in chloroform, diethyl, and poorly soluble in alcohol, acetone, hexane, and benzene.

2-aminopyridine UV spectrum when analyzed 208.24; Absorption peaks were observed at 260.89 nm.

When analyzing the UV spectrum of gossypol, absorption peaks were observed at 236.26, 289.88, and 374.00 nm.

When analyzing the UV spectrum of the Schiff base formed by gossypol with 2-aminopyridine, absorption peaks were found at 207.79, 248.5, and 383 nm, respectively, in contrast to those of adenine and gossypol [7-8].

The following results were obtained when analyzing the IR spectra of substances. For 2-aminopyridine at 3355.74-3294.11 cm⁻¹ due to the valence oscillations of the -NN₂ group, at 1449.49-1602.21 cm⁻¹ due to the valence oscillations of the -S = S-bond and at 1250.41-1306, Absorption maxima were observed at 98 cm⁻¹ due to the valence oscillations of the -N = S- bond [9].

When analyzing the IR spectrum of gossypol at 1578.28 cm⁻¹ at the expense of the valence oscillation of the bond s = c at 1710.81 cm⁻¹ at 1440.49 cm for -CHO at the expense of the deformation oscillation of the asymmetric -SN₃ group at 1360.02- At 1379.50 cm⁻¹ corresponds to the deformation oscillation of the symmetric -SN₃ group, and at 3513.39-3421.65 cm⁻¹ the corresponding absorption maxima of the valence oscillations of the internal and external molecular hydrogen bonds in the ON group were observed.

When analyzing the IR spectrum of the Schiff base formed by gossypol with 2-aminopyridine, the valence oscillation of the n S = C bond at 1504.9-1574.2 cm⁻¹, the valence oscillation of the asymmetric and symmetric -SN₃ group at 2868-2965.6 cm⁻¹ 1418,40-1450,36 cm⁻¹ asymmetric -SN₃ group deformation vibration, 1307,75-1334,09 cm⁻¹ symmetric -SN₃ group deformation vibration, 3491-3611,7 cm⁻¹ in ON group Although the maximum absorption due to the valence oscillations of the internal and external molecular hydrogen bonds is observed, at 1710.81 cm⁻¹ in the gossypol the valence oscillation of the -CHO bond disappears and is replaced by the valence of the -N = CH bond in the 1602.8-1672.9 cm⁻¹ branch vibration was observed. A

graph comparing these spectra to each other looked like this:

When the PMR spectrum of 2-aminopyridine was analyzed, it was 2.46 m.u. at the expense of N atoms in S₈, the doublet is 3.2 m.u. the singlet at the expense of N atoms in S₂, 6,875 m.u. the singlet at the expense of N atoms in the NH₂ group, 7.91-8.17 m.u. Double signals were observed taking into account the N atoms in the NH- group.

When analyzing the PMR spectrum of gossypol, 1,419–1,448 m.u. at (6N = 2xCH₃) multiplet at the expense of N atoms in the isopropyl group, 1,972–2,033 m.u. at (3N = CH₃) N atoms in the methyl group, 3,076 m.u. in - N atoms in the SN group, 7,142-7,184 m.u. a multiple of N atoms in the S₄-H group at 9.01–10.05 m.u. at (N = ON) N atoms in the ON group, 11,17-11,71 m.u. The absorption maxima were determined at the expense of N atoms in the SNO group.

The PMR spectrum of the Schiff base formed by gossypol with 2-aminopyridine was 1,369- .u 1,401 m. at (6N = 2xCH₃) multiplet at the expense of N atoms in the isopropyl group, 2,026 m.u. at (3N = CH₃) at the expense of N atoms in the methyl group, 7,142-7,184 m.u. at S₄-H group N atoms multiplet, 9,973-10,772 m.u. in (N = ON) at the expense of N atoms in the ON group, but at the expense of N atoms in the -CHO group in Gossipol at 11.17-11.71 m.u. lost the signal given at 8,150-8,238 m.u., which belonged to the -NN-CH group instead. absorption peaks were observed in the field.

validity was verified by potentiometric titration of the original and synthesized substances. The aim was to study the effect of the degree of validity of substances on the yield of the reaction, the kinetics of the reaction, the biological activity of the synthesized substances, and the tautomeric state of the substances (benzoin, quinoid)

Table 2
points of titration of substances according to the results of the titration curve with 3M KCl

No	Article name	pH index
1	Gossypol	8.1
2	2-aminopyridine	9.0
3	Di- (2-aminopyridine) gossypol	8.4

Due to the poor water solubility of gossypol and its derivatives, supramolecular complexes with a monoammonium salt of glycyrrhizinic acid (GKMAT) in a ratio of 1: 4 were obtained to make them water-soluble [10].

Table 3
Synthesized supramolecular compounds separate physical and chemical constants

N o.	Supramolecular complex	Mole Relative	Solvents	T col, °C	Rf	The action is mld,	Ran ks
1	I + GKMAT	1 4	H ₂ O	20 1-04	0. 6 5 ¹	9 6	brigt red
2	II + GKMAT	1 : 4	H ₂ O	21 7-19	0. 5 5 ¹	8 9	dark yellow
3	III + GKMAT	1: 4	H ₂ O	22 2-24	0. 5 9 ¹	8 6	jaun dice

System: ¹ Benzene - acetone (2 : 1)

The UF, IR, and PMR spectra of the supramolecular complexes of the obtained Schiff bases formed with GKMAT were also analyzed, and the following results were obtained when they were compared with the spectra of the original substance Schiff base. Gossypol formed with 2-aminopyridine and GKMAT were compared to the UV spectra of 207.79, 248.5, and 383, nm, respectively., 39 nm field.

When analyzing the IR spectra of supramolecular complexes of the Schiff base in a 1: 4 ratio with GKMAT, we can see that the absorption maxima of the Schiff base are slightly

expanded at the expense of hydrogen bonds in the supramolecular complex.

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