On the basis of the modified Bjerrum's method constants of stability of a polymeric complex at various values of ionic strength of solution were calculated (0.10; 0.50; 1.00 mol/L) on which thermodynamic equilibrium constants of the studied processes (Table 2) were found. Stability of a complex is defined by the size of an equilibrium constant of its formation. The last is a measure of the emitted warmth and change of an entropy during reaction.

Apparently from Table 2, values of stability constants of a polymer-metal complex of an iron (III) ion with PVP with temperature increase decrease therefore it is possible to assume that a complexing process is the exothermic one. Consideration of an entropy is very important at formation of $[ML_6]^{n+}$ complex from $[M(H_2O)_6]^{n+}$. In such cases replacement of each subsequent molecule H_2O with a ligand L is at a loss more and more. In our case replacement of one molecule of water with each subsequent mono-link of PVP reduces by unit number of possible coordination places for the following mono-links of polymer. Besides, the more mono-links of molecule PVP in a complex, the probability of replacement of molecules of water with the subsequent polymeric ligand is less. Both of these factors reduce probability of formation, therefore, and stability of more high-replaced complexes. Other factors, such as steric repulsion between ligands larger on volume basis and a coulomb relative repulsion of ligands-anions at their replacement of molecules of water at a positively charged ion of metal, can also detain coordinating of additional ligands [21].

On the basis of results of conducted studies taking into account literary data it is possible to submit the following scheme of formation of a complex on the basis of iron(III) chloride and PVP (Fig. 4).

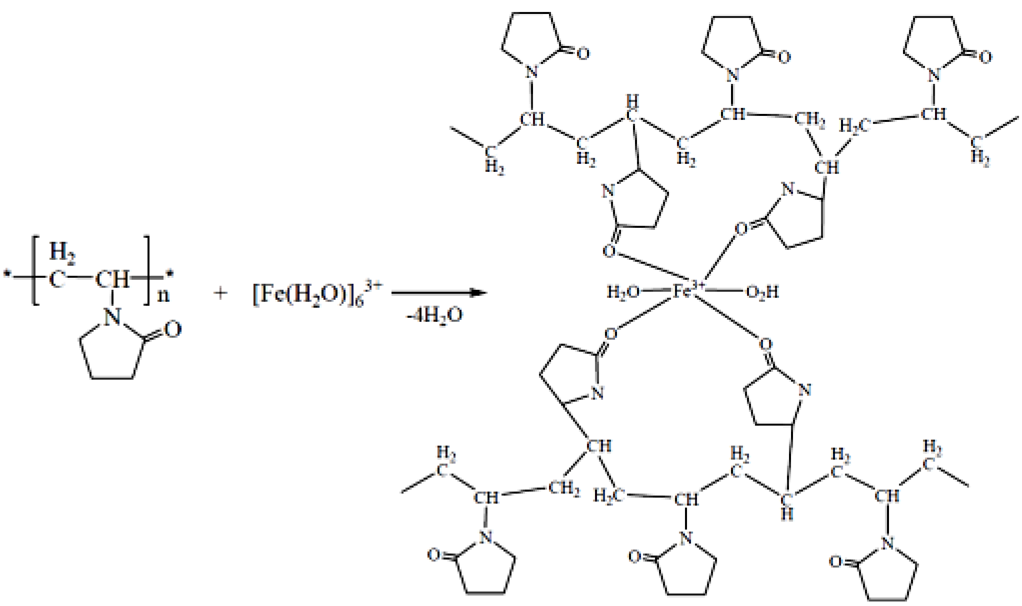

Figure 4. Scheme of formation of the PVP-iron(III) chloride complex

Table 2

Values of stability constants of the polymer-metal PVP-Fe^{3+} complex in an aqueous medium

T, K	*I*	lgβ
298	0	31.00
	0.1	21.45
	0.5	25.95
	1.0	32.51
318	0	23.00
	0.1	22.86
	0.5	28.50
	1.0	26.10
333	0	10.10
	0.1	14.00
	0.5	12.40
	1.0	13.40