

COMPLEX FORMATION IN THE SYSTEM Zn^{2+} -PYRIDOXINE-WATER IN THE PRESENCE OF SURFACTANT

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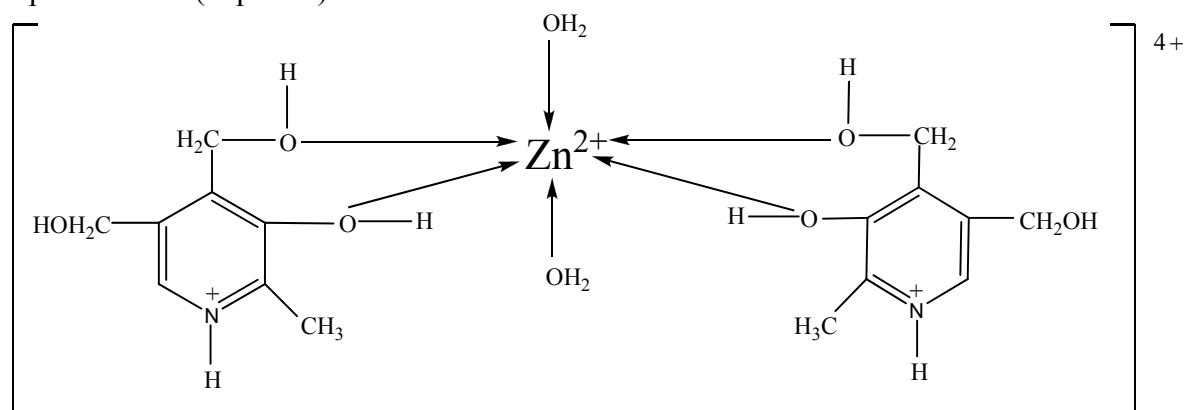
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Solutions of surfactants are the unique environment for many chemical processes. They influence on complex formation, on the composition and stability of the complex [1,2].

Complex formation in the system Zn^{2+} -pyridoxine-surfactant in aqueous environment is studied. Studies are carried out by UV-spectroscopy method in the presence of anionic surfactant sodium pentadecylsulfonate (SPDS). The composition and stability of complex are obtained by methods of isomolar series and molar ratios, studies are conducted for premicellar solutions of SPDS. At the first step of studies the effect of Zn^{2+} ions and pyridoxine on critical micelle concentration (cmc) of SPDS in aqueous solutions has been studied. It was observed that cmc of SPDS decreases in the presence of Zn^{2+} ions (cmc of SPDS in aqueous solutions in the absence of Zn^{2+} is $1.62 \cdot 10^{-3}$ mol/l and at $[Zn^{2+}] = 0.35 \cdot 10^{-4}$ mol/l is $0.12 \cdot 10^{-3}$ mol/l). Under influence of pyridoxine cmc of SPDS increases (at $[pyridoxine] = 1.0 \cdot 10^{-2}$ mol/l cmc of SPDS in aqueous solutions is $2.39 \cdot 10^{-3}$ mol/l).

It is shown experimentally that in the formed complex the ration of Zn^{2+} :pyridoxine is 1:2. Complex also contains 2 water molecules. The structural formula of the complex may be represented as (at pH <5):



The studies have shown that SPDS practically has no effect on the composition of the inner sphere of the complex: it means that the interactions between Zn^{2+} and pyridoxine are stronger than between Zn^{2+} and SPDS. But the presence of PDS⁻ anion in the inner sphere of the complex has effect on the stability of the complex: in the absence of SPDS $\lg\beta = 5.5$ and in the absence of SPDS $\lg\beta = 5.2$.

[1] M. Yoshikazu, S. Masashi and T. Masaaki, *J.Chem. Soc.Farady Trans. 1*, **1986**, 82, 1515-1517.

[2] Y. Umebayashi, and I. Ishigurus, *J.Colloid Interface Sci.*, **2001**, 237, 167-173.

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