THE BIOGENIC ROLE OF PHOSPHORUS

Kurilko A. S.
Scientific supervisor: Turchenko N. V.
National University of Pharmacy, Kharkiv, Ukraine
anzhikurilko@gmail.com

Introduction. Phosphorus has an important role in building tissues and ensuring the functioning of the body. The element is part of the protein, NA, nucleotides, ATP and other. In biological environments element is composed of phosphate ion, in the form of inorganic and organic in composition of biological active substances: nucleic acids, nucleotides, phospholipids, nucleoproteins, phosphoproteyidi, ethers of carbohydrates and other.

Aim. Review the biological properties of phosphorus.

Biological role of Phosphorus. Phosphorus is a unique role in the implementation of phosphorylation of carbohydrates and fatty acids, which leads to the formation of the universal energy of body cells. Due to the collapse of carbohydrate energy accumulated in the organic phosphoric acid compounds such as adenosine monophosphate, adenosine diphosphate, adenosine triphosphate, creating phosphate. Triprotic phosphoric acid is multifunctional reagent that provides versatility biochemical function of ATP. ADP and ATP - derivatives diphosphate $H_4P_2O_7$ and triphosphate $H_5P_3O_{10}$ acids. At physiological pH = 7.4 ATP and ADP completely ionized to anions ATP^{4-} and ADF^{3-} that hydrolyzed: $ATP^{4-} + HOH \leftrightarrow ADF^{3-} + HPO_4^{2-}$. In intracellular fluid ATP and ADP are in the form of complexes with magnesium: $MgATP^{2-}$ and $MgADP^{-}$. In enzymatic reactions, where ATP is a donor of phosphate group, the active form is complex $MgATP^{2-}$. For this reason, Magnesium is a vital element for the body. Phosphorus is in the middle of the periodic system, has a middle energy of density electron affinity (as opposed to very electronegative F, O, Cl, N), and therefore the phosphorus and phosphoric acid inherent role of deposit and biocatalytic using of energy. Carbon and nitrogen are not able to participate in these processes because they do not have d-orbitals. Arsine is toxic and silicon insoluble acid was formed. From this perspective, Phosphorus is a unique example of individual chemicals. Exchange of phosphorus in the body is closely linked to calcium. The required ratio of the body Ca : P = 2 : 1. Phosphate ion takes part in the buffer system of blood. Phosphorus stimulates mental, heart, muscle activity involved in the metabolism of proteins, fats and carbohydrates. Nuclides phosphorus used in biomedical research mechanisms of metabolism and energy.

Conclusions. Thus, feature of the electronic structure of phosphorus atoms provides unique functions of its compounds: the ability to store and bio catalytic using of energy.