

## Obtaining Nanoparticles by Decomposition of Complex Compound of Titanium Metal with Some Ligands Containing Hydroxyl Group, and their Application for Degrading Harmful Organic Substances Under UV-Vis Light

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In this study, synthesizing new complex compounds of titanium with ligands containing organic hydroxyl, determining the structure of the isolated compounds using a set of independent research methods were investigated also study of complexation processes in solutions, synthesizing and determination of optimal conditions of nanoscale catalysts from organometallic complex from obtained complex (ligand containing hydroxyl group with titanium) and determination of the activity of the obtained catalyst in photodegradation reactions of organic compounds were considered.

To achieve this goal, it was necessary to solve the following problems: a) synthesizing new complex compounds and study their composition and structure by a set of independent methods of analysis, b) carrying out the theoretical modeling of various coordination units using modern software package to calculate the electronic and geometric characteristics of ligands and their complexes, c) synthesis of catalytically active Nano-sized titanium dioxide, d) Modifying Nano-sized titanium dioxide with cations of transition metals, e) determination of the possibility of the obtained catalysts for photodegradation of organic phenol-containing compounds such as bromophenol blue and salicylic acid.

In result, eight complex compounds of titanium (IV) with ligands containing hydroxyl aromatic and six bimetallic complex compounds which contained in addition to titanium (IV) cations ions of divalent transition elements such as manganese, cobalt and nickel, are isolated in the crystalline state and studied by a combination of physical and chemical methods. Doping of TiO<sub>2</sub> nanoparticle with 3d-transition metal cations was carried out by thermal decomposition of Ti (IV) complex compounds in the presence of transition metal compounds.

### Biography:

Dr. Yahya Absalan highly accomplished environmental scientist with demonstrated expertise in analyzing the molecular composition and properties of raw materials and metals. Outstanding academic record; earned full scholarship to complete Ph.D. at the People's Friendship University in Russia (RUDN). Dynamic researcher capable of rapidly synthesizing metal and inorganic organ metallic compounds, complexes, Nano catalysts and photocatalytic application. Published in numerous peer-reviewed journals. Demonstrated teaching and mentorship abilities; experienced in teaching General Chemistry and Inorganic Chemistry to RUDN students.