

New Methods for the Determination of Chemical Oxygen Demand

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Received: November 13, 2016; Accepted: December 12, 2016

DOI: 10.17721/moca.2017.17-23

Literary data on new methods of determining COD using heterogeneous photocatalyst – semiconductor nano-TiO₂ were systematized. Disadvantages of traditional methods has been observed. The results of the new study oxidative systems results are presented. Proposed results of conditions of oxidation were analyzed. The reaction time, pH value, dosage of the photocatalyst, initial concentration of Cr(VI), oxidation of chloride ions, the effect of molecular oxygen, the results in the process of UV irradiation (without TiO₂) and to the dark reaction (with TiO₂) were considered. Stoichiometric ratios with holes and electrons, organic compounds are oxidatively degraded and K₂Cr₂O₇, which is chemically restored were paid and studied. Proposed radical oxidation mechanism, especially the use of different chemical oxidants (K₂Cr₂O₇, Ce(VI), KMnO₄) as acceptor of photogenerated electrons considered. Advantages of new photocatalytic oxidative shown. Outstanding issues and shortcomings developed methods determined COD formulated. The results of their research systems UV-nano-TiO₂-K₂Cr₂O₇ are present. Ambiguous impact on the initial concentration of K₂Cr₂O₇ degree of oxidation of organic compounds by comparing the absorption spectra dichromate ions and UV-radiation field of the lamps shown. The limited use of d-glucose, potassium hydrotartrate and any other easily oxidized substances as standard substances in developing methods for determining COD shows.

Keywords: photocatalytic oxidation, catalyst nano-TiO₂, chemical oxygen demand