

ABSTRACT

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Title of Rigorosis Thesis: The influence of Quantum Dots particles to chemiluminescence based on oxidation by permanganate

Quantum Dots (QDs) particles are semiconductor nanocrystals, which have become attractive for many scientific institutions for its unique optical and physical properties. In this thesis it was found out, whether QDs have any effect on the intensity of chemiluminescence at the reaction with potassium permanganate in sulfuric acid medium. QDs with emission maxima at 520, 575, 603 a 636 nm were tested, QDs solutions were added subsequently to the chemiluminescent system, where the oxidized analytes were organic compounds such as gallic acid, hydroquinone, pyrocatechol, resorcinol and phloroglucinol. Achieved results were then compared with the measurement without addition of QDs to the chemiluminescent system. The experiment was performed by the flow method sequential injection analysis (SIA). Obtained results showed, that the highest growth of intensity of chemiluminescence was recorded using QDs with emission maximum at 520 nm, the procentual growth of the intensity of CL ranged to 26,73 %. The values exceeded the relative standard deviation (RSD) 3% only in a few cases, the influence of QDs on repeatability of measurement is negligible. There are not any sediments of QDs in the flow system and the manipulation with them was carried out without problems.