

ABSTRACT

This theses focuses on preparation and characterisation and comparison of two types of polymer nanoparticles using photophysical methods. The first type was polystyrene nanoparticles prepared by modified nanoprecipitation method from polymeric sulfonated nanofiber membranes with different content of sulfonated groups. The second type was polymer nanoparticles with different length of hydrophobic polycaprolactone (PCL) and hydrophilic poly(ethyleneglycol) (PEG) blocks. Both types of nanoparticles contained encapsulated photosensitizer 5,10,15,20-*meso*-tetraphenylporphyrin with a high quantum singlet oxygen yield.

In the prepared nanoparticles with a photosensitizer, the kinetics of singlet oxygen generation was studied using time resolved spectroscopy. The relative efficiency of photooxidation was studied using external acceptor of singlet oxygen. The effect of temperature, size and matrix (type of polymer) of nanoparticles on photooxidation efficiency was also studied. In the next part of this these was studied the influence of time on the size and stability of nanoparticles and also the effect of solution pH and ionic strength on prepared nanoparticles.