

CHARACTERIZATION OF THE MIXING BETWEEN MEH-PPV AND SINGLE WALL CARBON NANOTUBES USING FLUORESCENCE SPECTROSCOPY

Steven Pellizzeri, Dr. Christopher Collision, Department of Chemistry,
slp7858@rit.edu, cjcscha@rit.edu.*

Poly(2-methoxy-5-(2'-ethyl-hexyloxy)-1,4-phenylene vinylene) or MEH-PPV is a widely used conjugated polymer in the field of organic light emitting diodes (OLED). MEH-PPV has also become a standard for organic photovoltaics where light energy is harvested and then converted into electrical energy. One limitation to photovoltaic efficiency is that MEH-PPV is a relatively poor conductor of electricity. Single-wall carbon nanotubes (SWNTs) can be incorporated to improve the efficiency of these devices because of their good electrical conducting capabilities. Yet relatively little is known about the interactions of these two materials.

The aim of our project is to study the fluorescence of MEH-PPV and to determine the concentration of SWNTs that are needed to quench the fluorescence of this system. Fluorescence quenching is not only an indicator of physical and electrical interaction but ultimately it may lead to a quantification of SWNT's value as an electron acceptor in a photovoltaic device.

Initial analysis is being done to study the mixing of MEH-PPV and SWNTs in different solvent/surfactant systems. It is vital to ensure consistent mixing if reproducible fluorescence quenching results are to be attained. We will characterize the mixtures using UV-Vis spectroscopy, Fluorescence measurements, and also by dilute solution viscometry.