The photophysical characteristics of aryl substituted porphyrins synthesized (Figure 1) by our groups before in two different solvents (chloroform (CHCl₃), tetrahydrofuran (THF)) and immobilised phases (PVC film, sol-gel matrix) were determined in this study. Photophysical and photochemical studies of porphyrins have been of increasing interest in fields extending from chemistry to biology [1,2]. The porphyrin efficacy in photonic devices and photodynamic therapy (PDT) depends on its photophysical characteristics, such as lifetimes and quantum yields of the excited (singlet and triplet) states [3]. Sol-gel matrix by tetraethoxysilane (TEOS) hydrolysis and condensation and PVC films from a mixture of polyvinyl chloride, bis(2-ethylhexyl)phthalate, and porphyrin in tetrahydrofuran were prepared. The absorption and emission spectra of porphyrin derivatives in both solution phase and immobilized phase were examined by spectrophotometry and spectrofluorimetry. The porphyrins derivatives exhibited moderate results concerning with Stokes shift values which range from 88 to 101 nm in all of the employed media. The quantum yield values in PVC film and sol-gel matrix was higher than solution phase for all porphyrin derivatives. Moreover, all of the calculation Fluorescence quenching rate constants, $k_q$ values in immobilized phases for porphyrin derivatives were higher than those obtained the case in solution phase.

Figure 1. The porphyrins determined photophysical properties

References