

FREDERIK BROENDSTED, CHRISTOPHER A. DEROSA, Dept of Chemistry, West Virginia Wesleyan College, Buckhannon, WV 26201. Optical Properties of Donor/Acceptor Chalcone Materials in Solution and the Solid State.

Organic fluorophores have gained interest in microscopy and optoelectronic applications. In particular, chalcone-based derivatives have been discovered as organic alternatives to conventional emitters such as metal complexes and inorganic salts. Advantages include bright fluorescence, low toxicity, and micro-environmental sensitivity to solvent polarity, viscosity and pH. In particular, properties such as solvatochromism (solvent polarity) can be utilized to sense microenvironment cellular components, such as the nonpolar phospholipid-based cell membranes. In this presentation, a series of chalcone-based materials were synthesized to probe the effects of modulating the donor/acceptor pairing (e.g. dicyanovinyl and carbonyl) and aromatic π -conjugation (e.g. naphthyl and thienyl). Dyes were prepared in 2-3 in low to moderate yields. Preliminary results in dichloromethane showed green fluorescence and modest quantum yields (~30%). Dyes showed solvatochromic behavior where the fluorescence is blue in nonpolar solvents (toluene) and orange in polar solvents (dimethyl sulfoxide) ($\Delta = 120\text{nm}$). Multiple fluorescence chromisms in the solid state is also observed. Optical properties of the dyes and future directions will be presented.