CHAPTER IV

CONCLUSION

In conclusion, we successfully demonstrated the potential use of calcium carbide, a cheap and widely available primary chemical feedstock, as an alternative starting material. We used carbide as an electrophile to react with the nucleophilic oximes to generate pyrroles. The optimization study revealed that 1.0 equiv. of acetophenone oxime, 6.0 equiv of calcium carbide, 1.5 equiv of potaasium hydroxide, 3 mol% 18-crown-6 and DMSO/water (50:1) as the solvent gave the desired pyrrole in 73% yield. Application of the optimized condition for a variety of oximes, generated the desired pyrroles in poor to good yields (3-73%) along with the over-vinylated by-products in 0-52% yields. In addition, a multiple-gram scale was achieved upon the conversion of 2 grams of acetophenone oxime into the pyrrole in 50% yield implying its high potential for some industrial applications. Importantly, direct synthesis of 2-phenylpyrrole from acetophenone has been developed in a one-pot fashion. We successfully converted the acetophenone to phenylpyrrole via the oxime formation followed by the Trofimov-type reaction in 56% yield. Finally, highly conjugated BODIPY was successfully synthesized from 2-arylpyrrole in 54% yield. Photophysical properties of this BODIPY showed the absorption and emission maximum around 550 nm and 600 nm, respectively, which appeared as red fluorescence under blacklight. For future work, it is our goal to produce the 2-aryl pyrrole in the large production. The study on the commercial pressure reactor will be investigated where the effect of concentration, string rate and the reaction size will be monitored. Also the purification of 2-arylpyrrole will be developed into more practical method either crystallization or distillation.

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