



Abstract

Thiophenes can react as dienes in Diels-Alder reactions with dienophiles. Many synthetic methods for the preparation of this system have been reported in the literature. This compound is usually prepared from the 1,4-diketones. But most of these procedures require harsh conditions, such as high temperature ($>120^{\circ}\text{C}$) and catalyst. The objective of this study is to find simple method and mild catalysts, which can promote to form Tetraphenyl thiophenes more efficiently and practically. However it was found that disappointing yields were obtained in most attempts. In this study, a simple, convenient and modified procedure is used for the synthesis of 2,3,4,5-tetraphenylthiophene (TPT) via aldol reaction. In the first step Dibenzyl sulfide (DBS) is synthesized via two different methods. The yield of DBS prepared from method 2 is 85% in less time with high speed of stirring while other method gives 80% yield of DBS, but the reaction is very time taking. In the second step, the synthesized dibenzyl sulphide (DBS) and 1,2-diphenylethane-1,2-dione is dissolved in ethanol (solvent) with the addition of Potassium hydroxide (base) which acts as condensation catalyst while refluxing the reaction mixture and 2,3,4,5-tetraphenylthiophene is obtained. During the optimization of the conditions of each individual reaction, the solvent, the catalyst and the temperature play an important role. Characterization like UV-VIS, FT-IR, ^1H NMR, ^{13}C NMR and GC-MS analysis facilitated in structure compilation.

Keywords: TPT, 1,2-diphenylethane-1,2-dione, DBS, 1,2-diketones, UV-VIS, FT-IR, NMR, GC-MS.