UNIVERSITI TEKNOLOGI MARA

CYCLOHEXYLDIPHENYLPHOSPHINE IN HECK COUPLING

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ABSTRACT

This study describes mainly the significance of phosphine ligand that is cyclohexyldiphenylphosphine. Phosphine ligand have been used in Heck reaction together with other conditions chosen such as silver nitrate, potassium acetate, palladium chloride and dimethylformamide to synthesise stilbene that is 3,4-dimethoxy-12-acetoxystilbene. All reaction conditions chosen were appropriate to synthesise the desired compound. This study was carried out using Heck reaction to achieve the objective of this study. Heck reaction was found to be the efficient method. Prior to Heck reaction, the hydroxyl group in 4-iodophenol was protected by forming 4-iodophenylacetate. The coupling of 4-iodophenylacetate with 3,4-dimethoxystyrene gave 3,4-dimethoxy-12-acetoxystilbene. The product was analyzed using TLC and extracted using ethyl acetate and hexane. Purification of the reaction product was done by using column chromatography. The chemical structure of stilbene was confirmed by nuclear magnetic resonance spectroscopy.

Keywords: Cyclohexyldiphenylphosphine; Heck reaction; Stilbene.

CHAPTER 1

INTRODUCTION

1.1 Stilbene

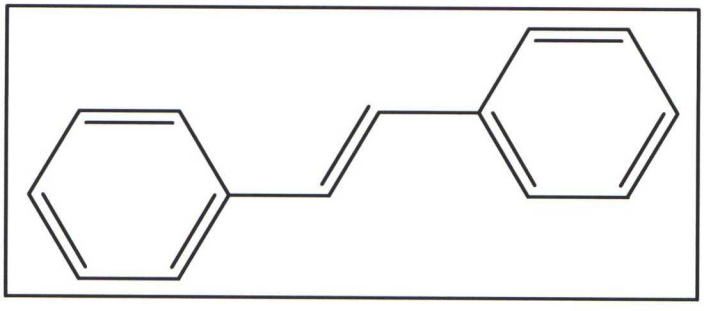

Figure 1.1: Stilbene

Stilbenes (Figure 1.1) are 1, 2-diphenylethylene analogue, naturally occur in higher family of plant. It can be in two forms, the *E*-stilbene and *Z*-stilbene. *Z*-stilbene is sterically hindered and less stable because of its melting point (MP) lower than *E*-stilbene. *Z*-stilbene has a MP of 5°C to 6°C, while the MP of *E*-stilbene is in the 125°C area, this illustrates the significant differences between the two of them. The name stilbene was derived from the Greek word *stilbos*, which means shining. Therefore, it is usually used in manufacture of dyes and optical brighteners, and also as a phosphor and a scintillator. Stilbene is also one of the gain mediums used in dye lasers (wikipedia, 2008).