

UNIVERSITI TEKNOLOGI MARA

**PHOSPHINE LIGANDS IN HECK COUPLING
REACTION**

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ABSTRACT

Phosphine ligands have been used as ligands in Heck reaction to produce stilbene. Nevertheless different ligands used in a reaction may produce different yields and effect of desired compound. Therefore, the aim of the research was to study the effect of different phosphine ligands in Heck coupling reaction. Heck reactions were done by using 4 different ligands, tri-*o*-tolylphosphine, tetraphenylphosphonium chloride, methyl triphenylphosphonium iodide and tetrakis (triphenylphosphonium) palladium with *para*-iodophenol and *para*-chlorostyrene as the starting materials. The yields of the desired compound are 33.85%, 70.29%, 6.51% and 11.43% respectively. The products in each reaction were analyzed using TLC and extracted using ethyl acetate and hexane. Purification of the reaction products was done by using column chromatography. The desired compound was sent for NMR analysis for structure characterization. The spectra were recorded using ¹H-NMR spectrometer in order to elucidate the structure of the compound. IR absorption was also used to analyze the structure characterization.

CHAPTER 1

INTRODUCTION

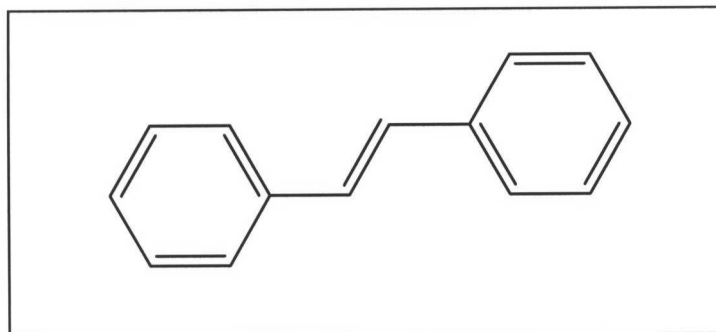


Figure 1.1: Stilbene

Stilbenes (Figure 1) are 1, 2-diphenylethylene analogue, naturally occur in higher family of plant. It can be found in two forms, the *E*-stilbene and *Z*-stilbene where *Z*-stilbene is sterically hindered and less stable. Its melting point is much lower than the *E*-stilbene. 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.

Although stilbene is not naturally forming compound, many stilbene derivatives also known as stilbenoids are present naturally in plants. An example of stilbene