1. Introduction

1.1 Background of Study

Organic synthesis is one of a special branch in chemical synthesis and is concerned with the construction of organic compounds by reactions. It is believed to be one of the most vital in organic chemistry because the organic molecules used to contain higher level of complexity compared to pure inorganic compounds. Organic synthesis specifically becomes centre of attraction for many scientists because the ability to produce beneficial products artificially for human goods. So far, organic synthesis plays a very important role in many sectors such as pharmaceuticals, agricultural and others.

On the other hand, development in chemical instruments becomes on the factors for many researches undergone their research more effectively. Advanced technology able to produce instruments with higher accuracy with less time needed to produce high quality products such as NMR, HPLC and others. The inventions of such scientific instruments promote the organic synthesis sector to widen up the study of interest. The development of science and technology offers assistance in many fields especially in medical field. This development introduced the importance of naturally occurring compounds in plants and researches have been done significantly to synthesize these natural compounds artificially. In this case, it can be concluded that organic synthesis is as highly developed, versatile and interdisciplinary branch of complex molecules and new materials with unexpected properties.

Flavonoids with 1,3-diarylpropane skeleton can be classified as an outstanding class of naturally occurring compounds (1-3). Chalcones or 1,3-diphenyl-2-propen-1-one derivatives are open chain unsaturated carbonyl system in which two aromatic rings are joined by three carbons of having α, β-unsaturated system (4).

Chalcones can be considered as the precursors of flavonoids and isoflavonoids (5-8) and are secondary metabolites of terrestrial plants that exhibit various biological activities (9).

1.2 Classification of Flavonoids

The flavonoids are members of a class of natural compounds that recently has been the
subject of considerable scientific and therapeutic interest. The flavonoids are ubiquitous to
green plant cells and therefore, could be expected to participate in the photosynthetic process
(10). Flavonoids are compounds found in fruits, vegetables and certain beverages (tea, coffee,
beer, wine and fruit drinks) that have diverse beneficial biochemical and antioxidant effects.
Their dietary intake is quiet high compared to other dietary antioxidants like vitamin C and E.

Flavonoids are polyphenolic compounds and are categorized according to chemical
structure such as flavonol, flavone, flavanone, isoflavone, catechin, anthocyanidin and
chalcone (11). The flavonoids have aroused considerable interest recently because of
their potential beneficial effects on human health.

1.3 Chalcones as Drugs

Chalcones are popular intermediates for synthesizing various heterocyclic compounds (12-14).
The compounds with the backbone of chalcones have been reported to possess various
biological activities such as antimicrobial, anti inflammatory, analgesic, antiplatelet,
antiallergic, antimalarial, anticancer, antiviral, antileishmanial, antioxidant, antitubercular,
antihyperglycemic, immunomodulatory, inhibition of chemical mediators release, inhibition of
leukotriene B_4, inhibition of tyrosinases and inhibition of aldose reductase activities (Rajendra
Prasad et al., 2008). The presence of a reactive α,β-unsaturated keto function in chalcones is found
to be responsible for their biological activities (Rajendra Prasad et al., 2008).

1.4 Problem Statement

There are varieties of methods available for preparation of chalcones. The Claisen-Schmidt
condensation and boron trifluoride-etherate methods were chosen to produce chalcones using
substituted aldehydes and substituted ketones. Due to the reversible nature of Claisen-Schmidt
reaction, the reactants were taken in excess of stoichiometric proportion in order to increase the
α,β-unsaturated product (15). Antimicrobial activity and toxicity test were examined to the synthesized compound to observe the pharmacologically effects of the synthetic compounds.