



Chapter IV

Conclusion and Future Works

1.1 Conclusion

Olefins have been raised a more interest to explore and synthesize since certain of them possess important biological roles. This could be including of value in the pharmaceutical field. The goals for manipulations of olefin in organic synthesis were of two types: the development of new synthetic methods, such as a route for making olefin referred to in this research, and the synthesis of target molecules.

To sum up for chapter II, phosphine oxides were attractive substrates which could be synthesized with high stereoselectivity; however, the intermediate β -hydroxy phosphine oxides had to be isolated and purified prior to their stereospecific decomposition to alkenes. Although the elimination step was stereospecific, *erythro* hydroxyphosphine oxide giving the *Z*-alkene and *threo* hydroxyphosphine oxide giving the *E*-alkene, it had to use a strong base as NaH. Therefore, for setting out to find a new condition with one-step or one-pot Horner-Wittig procedure that could give essentially pure (*Z*)- and (*E*)-alkenes would be a useful improvement. In addition to radical reaction had many advantages in organic synthesis such as reacting under neutral condition. For this reason, the combined methodology of the Horner-Wittig reaction and then using neutral radical reaction for preparation of stereospecific alkene was investigated without purification step in the mixture of *erythro* and *threo* diastereomers.

After thorough studies, it was found that the use of an equivalent of Ph_2SiH_2 in the presence of Et_3B (2 or 5 equiv) reacted with *S*-methyl dithiocarbonate or xanthate of the β -hydroxyphosphine oxide in benzene or toluene was the best condition. Although most of starting materials were remained in the reaction mixture and small amount of deoxygenation product was occurred, the maximum yield of the desired olefin was 15% yield. Ph_2SiH_2 turned out to be a useful hydrogen source in radical chemistry; however, this silane could not be efficiently used for the transformation of this xanthates to olefin. It was implied that this reaction conditions did not suit for the

homolytic cleavage of C-P bond. Although the preparation of alkene *via* this introducing reaction process was not successful, these xanthates that embodied phosphorus reagents with inherent asymmetry should offer a fertile area for future research both of deoxygenation and other related fields.

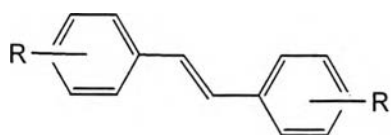
The chemistry of selenium has been growing recently. Especially, organoselenium could be used in mild and simple experimental conditions which were compatible with the stability of substrates and products in the preparation of unsaturated and functional complex molecules, especially natural products. Accordingly, the preparation of unsymmetrical diorganyl selenides has been regarded as a challenging topic in current organic synthesis, especially transformation to olefin, however, only a few successful examples as *tert*-alkyl phenyl selenides, were reported. It was notwithstanding that, until now, there was no report optimizing a methodology for the development of unsymmetrical diorganyl selenides *via* organic halides and diphenylphosphinites. For this reason, a novel and one-pot method for the preparation of alkyl phenyl selenides *via* organic halides and diphenylphosphinites using indium metal as a promoter was established.

As a conclusion of chapter III, the novel, one-pot, mild and practical approaches for the synthesis of unsymmetrical diorganyl selenides were developed from two kind of starting materials. Both organyl halides and alkyl diphenylphosphinites were exclusively transformed to unsymmetrical diorganyl selenides, primary, secondary and tertiary alkyl and acyl phenyl selenides, in moderate to excellent yields. Under the optimal condition, these starting materials reacted with PhSeSePh in the presence of In in CH₂Cl₂ at reflux brought about successfully exclusive unsymmetrical diorganyl selenides. In addition to the olefination results, the useful preparation of unsymmetrical diorganyl selenides was also leading to the occurrence of olefin which could be applied to synthesize some biologically active natural products using H₂O₂ under mild and neutral conditions.

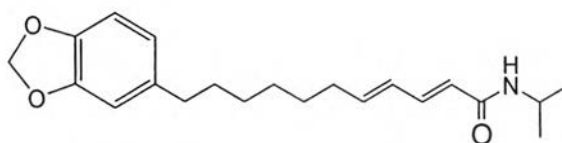
4.2 Propose for Future Work

The work performed in this research clearly revealed the attempts to develop a new synthetic method applied to olefin synthesis. The developed reaction could be used under mild, simplicity and neural conditions. In the future, this developed methods should be applied to synthesize some bioactive compounds.

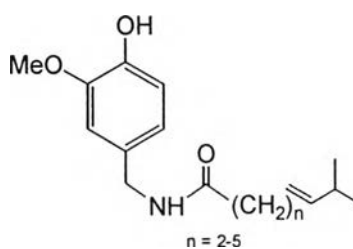
The new developed methods for the preparation of olefin *via* unsymmetrical diorganyl selenides from both organic halides and alcohols *via* organodiphenylphosphinites were successful. In the future, an application of this newly active method for preparation of some bioactive compounds such as stilbenoids, capsaicinoids will be continually planned to synthesize due to their importantly biologically compounds.



stilbenoids



Piperaceae amides



capsaicinoids