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| Thesis Title                 | Syntheses of $\beta$ -Chlorolactaldehydes and Canadensolide. Stereochemical Study Involving Optically Active Dimethyl Itaconate-Anthracene Adduct and Michael Initiated Ring Closure (MIRC). |
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## ABSTRACT

The first chapter of this thesis deals with syntheses of 3-Chloro-2-(alkylthio)propanal **A** employing equimolar amounts of 1,3-dichloropropene oxide **B**, alkanethiol and triethylamine, while reaction of **B** with 2 equivalents of alkanethiol and 2 equivalents of triethylamine in solvent such as tetrahydrofuran yielded 2,3-bis(alkanethio)propanal **C**.

The second chapter of the thesis described synthetic route to ( $\pm$ )-canadensolide **D** employing dimethyl itaconate-anthracene adduct **E** and 2-benzyloxyhexanal **F** as starting materials *via* aldol condensation, hydrogenolysis and flash vacuum pyrolysis reaction.

The last chapter described the resolution of racemic mixtures of dimethyl itaconate-anthracene adduct **E** and **G** *via* imide adduct **H** and **I** respectively, prepared from the mixture of adducts **E** and **G** and (*S*)-(-)-methylbenzylamine **J**. Although the hydrolysis of **H** and **I** were unsuccessful, the study of the asymmetric alkylation of **H** gave very promising results.

The mechanism and key intermediate **L** in the MIRC reaction of  $\alpha$ -methylene cyclopentenone **K** with the anion, derived from methyl diphenyl acetate or methyl *iso*-butyrate, and subsequent reacted with aldehyde in the presence of anhydrous zinc chloride give spirolactone **M** as a single product are also resolved.

