

## Table of contents

Preface	<i>iii</i>
Chapter 1. Introduction	3
1.1. Carbohydrate ligands' background in asymmetric catalysis	4
1.2. Asymmetric allylic substitution	7
1.3. Asymmetric Heck reaction	23
1.4. Asymmetric 1,2-addition of organometallic reagents	28
1.5. Asymmetric 1,4-addition of organometallic reagents	30
1.6. References	37
Chapter 2. Objectives	47
Chapter 3. Pd-catalyzed asymmetric allylic substitution	51
3.1. Background	51
3.2. A carbohydrate-based phosphite-oxazoline ligand library for Pd-catalyzed allylic substitution reactions	55
3.3. Pd-catalyzed asymmetric allylic substitution using pyranoside phosphite-phosphoroamidite ligands	113
3.4. Pd-catalyzed asymmetric allylic substitution using a sugar-based monophosphite ligand library	129
Chapter 4. Pd-catalyzed asymmetric Heck reactions	153
4.1. Background	153
4.2. Screening of a modular sugar-based phosphite-oxazoline ligand library in asymmetric Pd-catalyzed Heck reactions	155

Chapter 5. Ni-catalyzed asymmetric addition of trialkylaluminium to aldehydes	191
5.1. Background	191
5.2. Phosphite-oxazoline and phosphite-phosphoroamidite ligand libraries in the asymmetric Ni-catalyzed trialkylaluminium addition to aldehydes	193
5.3. Screening of a modular sugar-based phosphite ligand library in the asymmetric nickel-catalyzed trialkylaluminium addition to aldehydes	203
Chapter 6. Cu-catalyzed asymmetric 1,4-conjugated addition of trialkylaluminium reagents to enones	219
6.1. Background	219
6.2. Sugar phosphite-oxazoline and phosphite-phosphoroamidite ligand libraries for Cu-catalyzed asymmetric 1,4-addition reactions	221
6.3. Screening of a modular sugar-based phosphite ligand library in the Cu-catalyzed asymmetric 1,4-addition reactions	233
Chapter 7. Conclusions	249
Chapter 8. Appendix	255
Chapter 9. Agraïments	259