CONCLUSION

We have made reasonable success in achieving our objectives of this thesis mentioned in the beginning of this chapter. We have synthesized novel chiral catalysts \((2S)-1-(\text{diphenylphosphoryl})-2-\text{anilinocarbonylpyrroldine (216)}\), \((2S)-1-(\text{diphenylphosphoryl})-2-(4-\text{trifluoromethylanilino})\text{carbonylpyrroldine (227)}\), \((2S)-1-(\text{diphenylphosphoryl})-2-(4-\text{bromoanilino})\text{carbonylpyrroldine (228)}\), \((S)-1-(\text{diphenylphosphoryl})-2-(4-\text{fluoroanilino})\text{-carbonylpyrroldine (229)}\) and \((2S)-1-(\text{diphenylphosphoryl})-2-(3,5-\text{dimethylanilino})\text{carbonylpyrroldine (230)}\), containing N-P=O structural framework, and examined their applications as catalysts in the borane-mediated asymmetric reduction of prochiral ketones which provided the resulting secondary alcohols in 70-89% enantiomeric purities. We have demonstrated the application of two new chiral diamines \((3S)-3-\text{anilinomethyl}-1,2,3,4-\text{tetrahydroisoquinoline (231)}\) and \((2R)-2-\text{anilinomethyl}piperidine (232)\) as chiral catalytic sources for the borane-mediated asymmetric reduction of prochiral ketones. We have also examined the application of chiral amides, \((2S)-2-(\text{pyrid-4-ylamino})\text{carbonylpyrroldine (242)}\), \((2S)-2-(\text{pyrid-3-ylamino})\text{carbonylpyrroldine (243)}\), \((2S)-2-(\text{pyrid-2-ylamino})\text{carbonylpyrroldine (244)}\), \((2S)-N-(4-\text{hydroxyphenylamino})\text{-carbonylpyrroldine (245)}\), \((2S)-N-(3-\text{hydroxyphenylamino})\text{carbonylpyrroldine (246)}\) and \((2S)-N-(2-\text{hydroxyphenylamino})\text{carbonylpyrroldine (247)}\) as catalysts for borane-mediated asymmetric reduction of prochiral \(\alpha\)-halo ketones. We have also noticed that \((R,R)-1,2-\text{diaminocyclohexane (255)}\) provided low enantioselectivity as a catalyst in the borane-mediated asymmetric reduction of prochiral ketones.