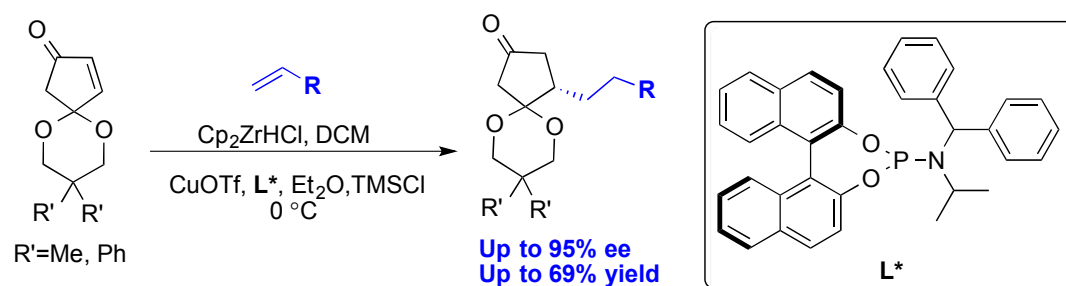


Asymmetric Conjugate Addition of Alkylzirconocenes to Cyclopentene-3,5-dione Monoacetals.

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The asymmetric conjugate addition of organometallics to cyclopentenones is highly desirable.¹ Many methodologies have been developed in recent years but fail to address the challenges of cyclopentenones.² Our group demonstrated that the conjugate addition of alkylzirconocenes to cyclohexenone derivatives is advantageous.³ However, when applying the methodology conditions to cyclopentenones, the yield was poor (23%) and the ee dropped (to 75%). Feringa *et al.* reported⁴ the derivatisation of cyclopentene-3,5-dione monoacetal with dialkylzinc reagents in moderate yield (40%) and high ee (90%). We decided to examine the hydrozirconation/asymmetric conjugate addition of alkenes to cyclopentene-3,5-dione monoacetal. After extensive screening, we have demonstrated that functionalized, enantioenriched cyclopentanone derivatives can be successfully prepared in that way. Further studies are currently undergoing to apply this methodology to the synthesis of prostaglandins.



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