Electronic Supplementary Material (ESI) for Catalysis Science & Technology.
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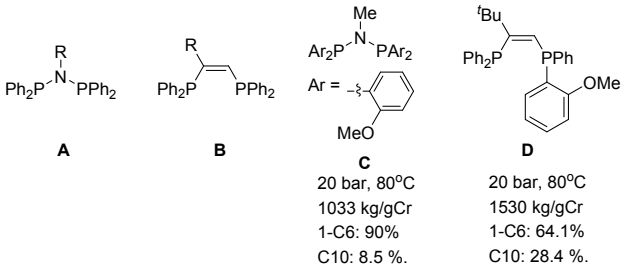


Figure 1. Selected Diphosphine ligands **A~C** in Cr-catalyzed ethylene tri-/tetramerisation and targeted ligand **D**

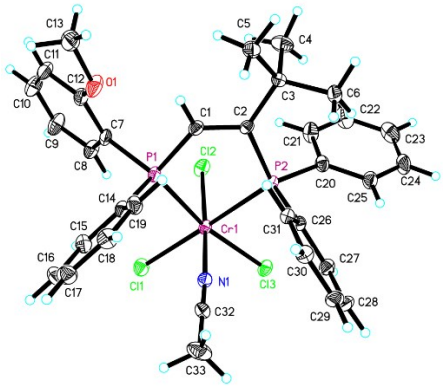


Figure 2. Molecular structure of Cr complex **C2**

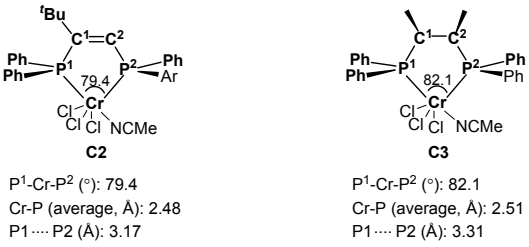


Figure 3. Comparison of molecular structure of complex **C2** with related complex **C3**.

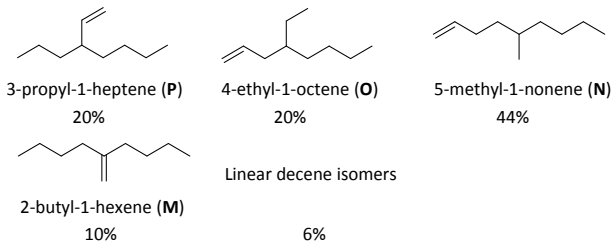


Figure 4. The relative amounts of C10 alkenes

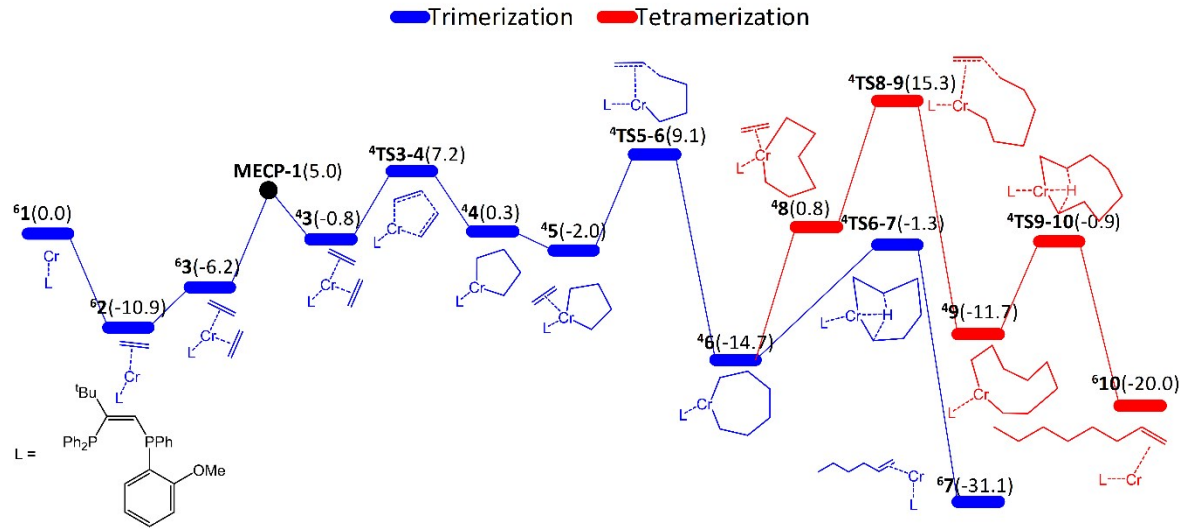


Figure 5. Relative Gibbs free energy profiles (kcal/mol) for ethylene tri-/tetramerization.

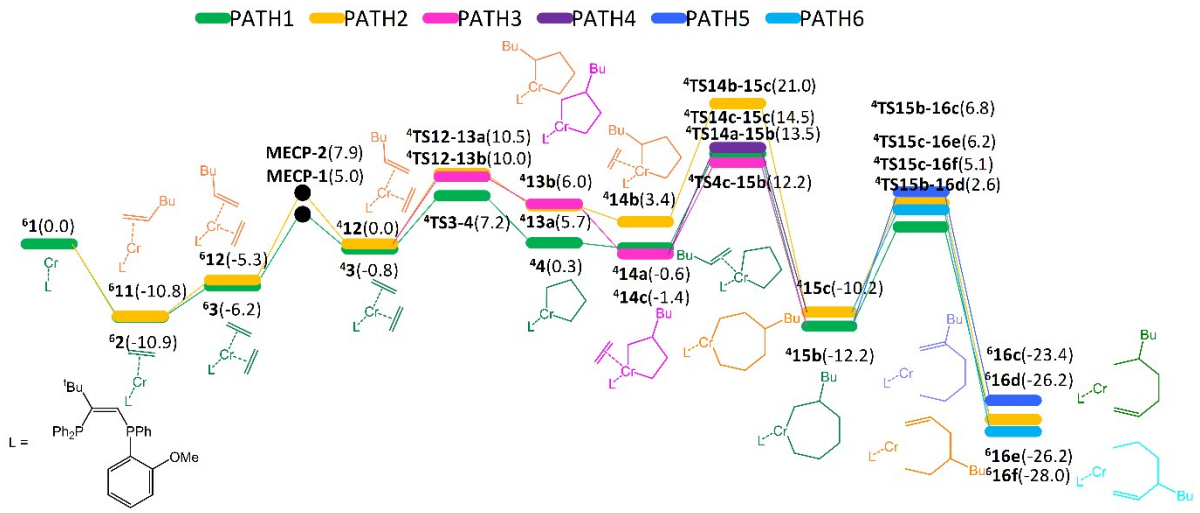


Figure 6. Relative Gibbs free energy profiles

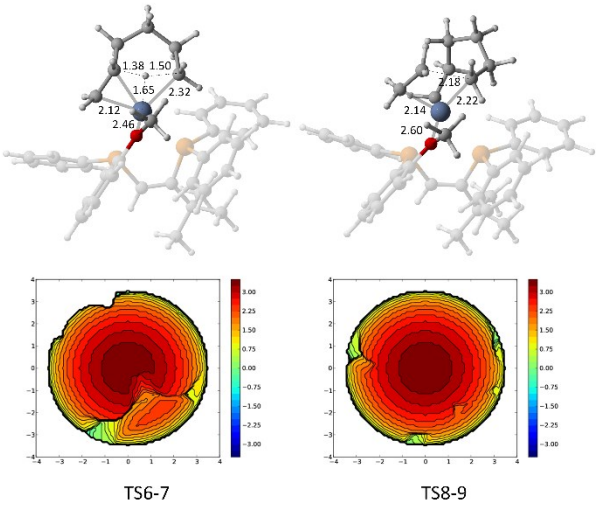
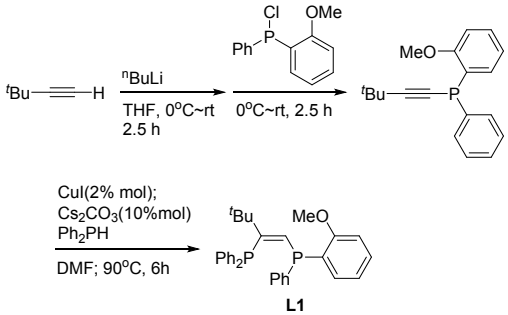
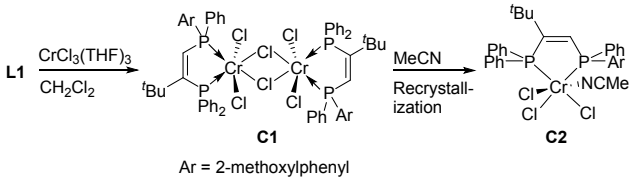


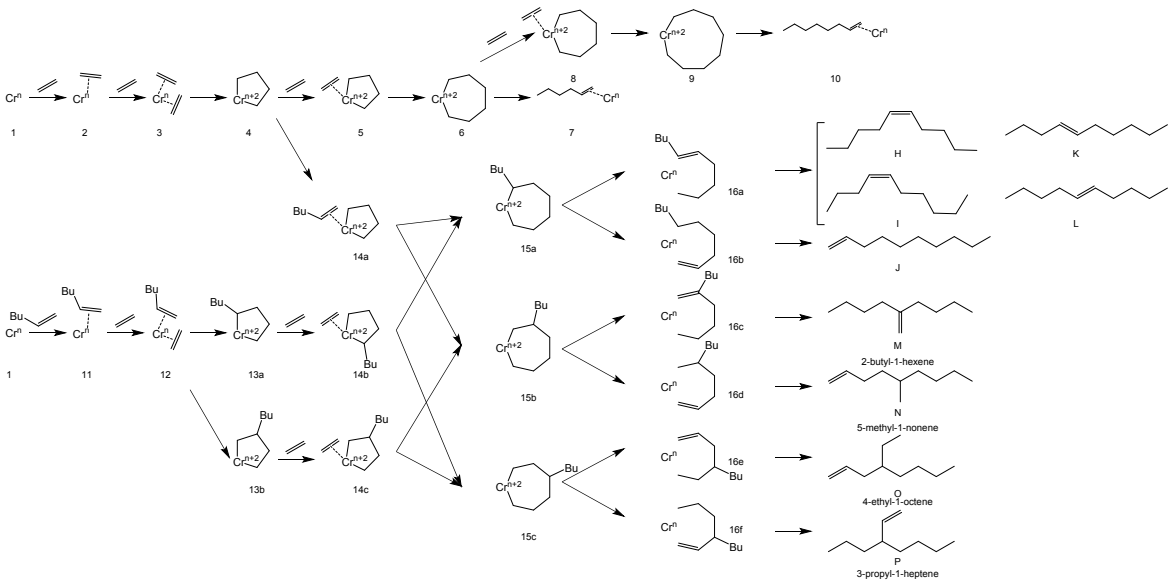
Figure 7. Optimized geometries of **TS6-7** and **TS8-9** transition-state structures



Scheme 1. Synthesis of diphosphine ligand **L1**.



Scheme 2. Synthesis of Cr complex **C1** and isolation of complex **C2**.



Scheme 3. The reaction pathways for the ethylene oligomerization and co-oligomerization.