

## Late transition metal-carboryne complexes : synthesis, structure, bonding, and reaction with alkenes and alkynes

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### Abstrak

Zaozao Qiu shows in this thesis that transition metals can mediate or catalyze the cycloaddition or coupling reactions of carboryne with alkynes or alkenes to afford benzocarboranes, alkenylcarboranes or dihydrobenzocarboranes. These results represent powerful strategies to assemble useful complex molecules from very simple precursors in a single operation. Carboranes have many applications in medicine. However, their unique structures make derivatization difficult and the limited efficient synthetic methods to obtain functional carborane materials have restricted applications of carboranes within a narrow scope. This work breaks a new ground in metal-carboryne chemistry and will have a significant impact on synthetic, cluster and materials chemistry.