Problem 1
Consider Cp₂M(H)₂.

2.1 Predict the geometry of Cp₂M(H)₂.

2.2 Provide a molecular orbital theory argument.

2.3 Assuming that Cp₂M(H)₂ is an 18e⁻ complex, assign M to a second row transition metal.
Problem 2
Consider Cp₂M(η²–C₂H₄).

2.1 Predict the structure of Cp₂M(η²–C₂H₄).

2.2 Provide a molecular orbital theory argument.

2.3 Assuming that Cp₂M(η²–C₂H₄) is an 18e⁻ complex, assign M to a second row transition metal.