

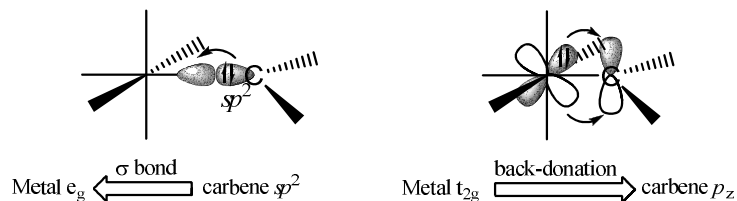
Print Name: _____

1.

Using molecular orbitals draw the bonding scheme for the following classes of metal carbene complex:

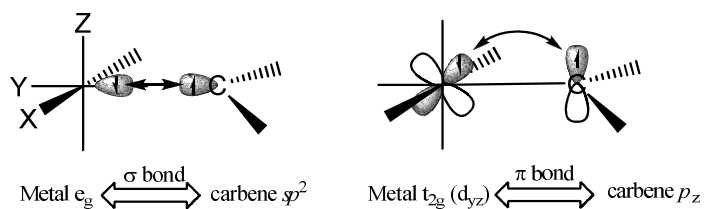
i) Fischer carbenes

(4 pts)



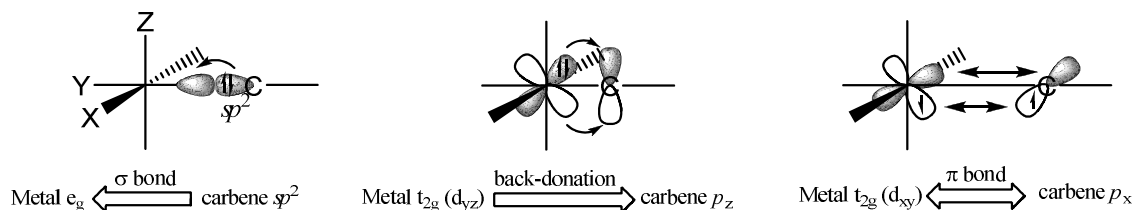
ii) Schrock carbenes

(4 pts)



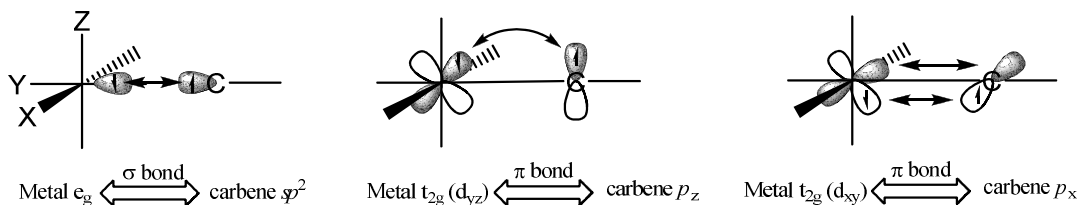
iii) Fischer carbynes

(6 pts)



iv) Schrock carbynes

(6 pts)



2.

(4 x 1 pts)

Match each class of metal carbene listed below with the multiplicity of its corresponding free carbene ligand.

$$\text{Multiplicity} = (2 \times \text{spin}) + 1$$

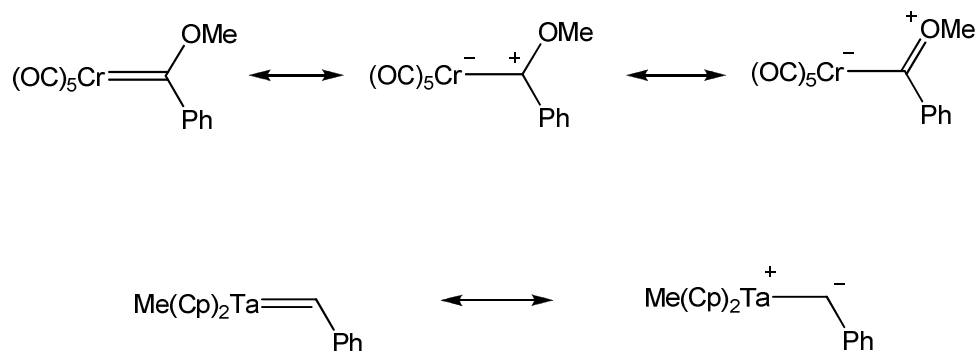
$$M = 2S + 1$$

Fischer carbyne	=	doublet
Schrock carbene	=	triplet
Schrock carbyne	=	quartet
Fischer carbene	=	singlet

3.

(2 x 4 pts)

Draw resonance structures for the following two complexes.



4.

(2 pts)

In the following reaction draw arrows to illustrate the flow of electrons which results in bond cleavage and bond formation.

