

1(5). Write the Lewis dot structure showing the valences electrons for atomic B.

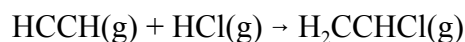
This element forms only one common, simple ion. Which noble gas is this ion isoelectronic?

Write the Lewis dot structure showing the valences electrons for atomic S.

This element forms only one common, simple ion. Which noble gas is this ion isoelectronic?

2(5). Which set of charge and bond length will produce the strongest lattice energy?  
 Charge (high or low) \_\_\_\_\_ Bond length (long or short) \_\_\_\_\_

3(10). Use the bond energy data to calculate the enthalpy of reaction for



Single Bonds										
H	C	N	O	F	Si	P	S	Cl	Br	I
436	413	391	463	565	318	322	347	432	366	299
	346	305	358	485			272	339	285	213
		163	201	283				192		
			146		452	335		218	201	201
				155	565	490	284	253	249	278
					222		293	381	310	234
						201		326		184
							226	255		
								242	216	208
									193	175
										151

Multiple Bonds			
N=N	418	C=C	602
N≡N	945	C≡C	835
C=N	615	C=O	732
C≡N	887	C≡O	1072
O=O (in O <sub>2</sub> )	498		

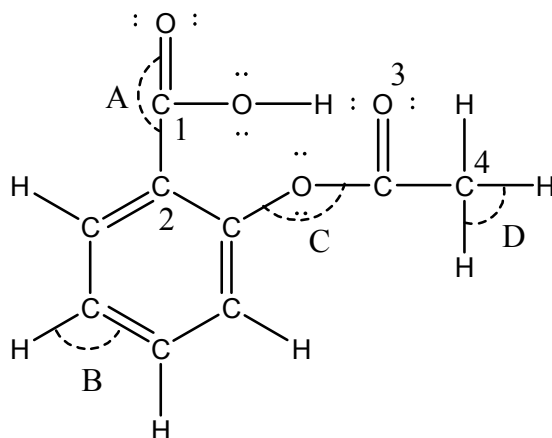
4(10). Write the molecular orbital configuration for O<sub>2</sub>.

What is the bond order? \_\_\_\_\_ What kind of bonding is present? \_\_\_\_\_  
 What is the magnetic behavior? \_\_\_\_\_

Write the molecular orbital configuration for O<sub>2</sub><sup>2-</sup>.

Which species is more stable? \_\_\_\_\_ Which species has the shorter bond? \_\_\_\_\_

5(15). The Lewis structure for aspirin is



What are the approximate bond angles:

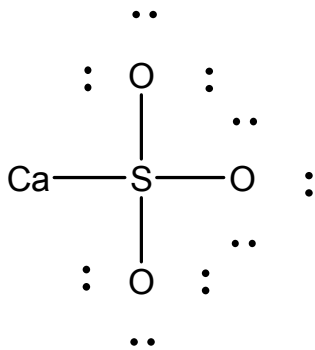
A \_\_\_\_\_ B \_\_\_\_\_ C \_\_\_\_\_ D \_\_\_\_\_

What is the hybridization of the numbered atoms:

1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_

Circle the shortest CO bond(s).

6(5). Briefly describe what is wrong with the following Lewis structure for  $\text{CaSO}_3$ .



7(20). Two possible Lewis structures can be written for HOCN. Calculate and indicate clearly the formal charge for each atom in each structure. Circle the preferred structure or draw a double headed arrow between the structures if both structures are resonance hybrids.



8(40). For each species, draw the Lewis structure(s), make a VSEPR sketch and identify the molecular shape, and make a valence bond "puff-ball" sketch showing the bonding.

