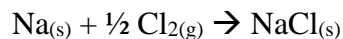


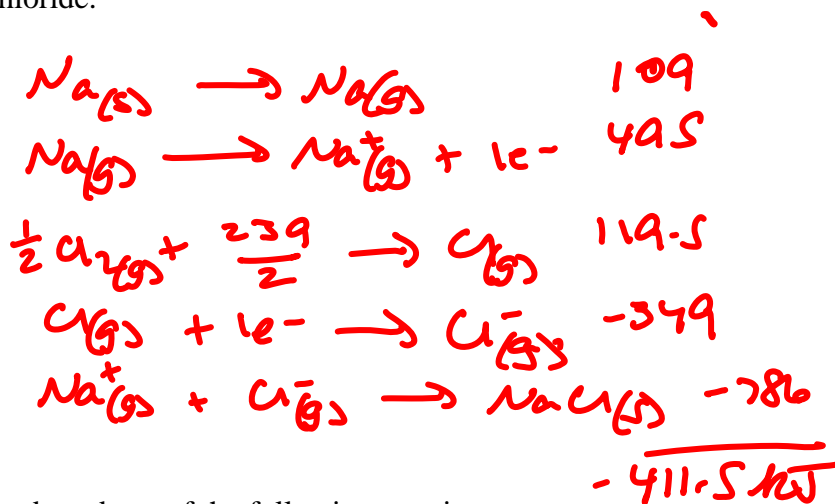
Name _____ Date _____

REVIEW FOR TEST

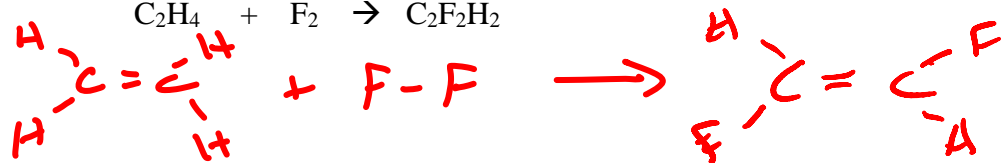
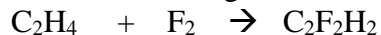
1. Use the following data to estimate ΔH_f° for sodium chloride.



Lattice energy	-786 kJ/mol
Ionization energy for Na	495 kJ/mol
Electron affinity of Cl	-349 kJ/mol
Bond energy of Cl_2	239 kJ/mol
Enthalpy of sublimation for Na	109 kJ/mol



2. Write out the Lewis Dot Diagrams for the reactants and products of the following reaction:



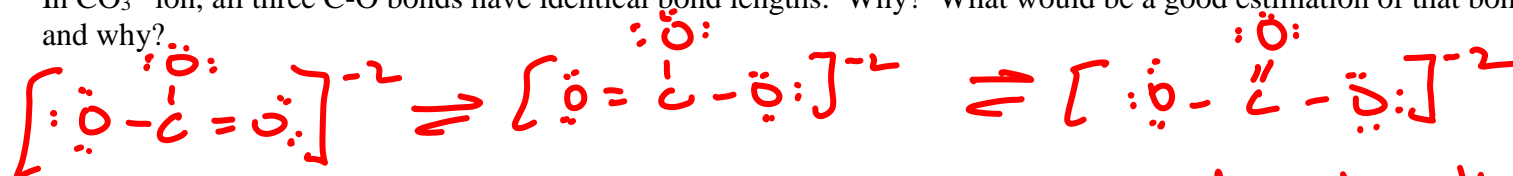
Use the bond energy table to calculate the enthalpy change for this reaction

$$\begin{aligned}
 & \sum \text{BE}_{\text{broken}} - \sum \text{BE}_{\text{formed}} \\
 & = [4(\text{C}-\text{H}) + 1(\text{C}=\text{C}) + 1(\text{F}-\text{F})] - [2(\text{C}-\text{H}) + 2(\text{C}-\text{F}) + 1(\text{C}=\text{C})] \\
 & = [4(413) + 1(614) + 1(154)] - [2(413) + 2(485) + 1(614)] \\
 & = (2420) - (2410) \\
 & = 10 \text{ kJ}
 \end{aligned}$$

3. Consider the following bond lengths:

C-O	143 pm
C=O	123 pm
C≡O	109 pm

In CO_3^{2-} ion, all three C-O bonds have identical bond lengths. Why? What would be a good estimation of that bond length and why?



because of resonance the bond length would be shorter than a single bond and longer than a double bond

4. Distinguish between a covalent bond, polar covalent bond and ionic bond

- sharing equally
- no dipole

- sharing unequally
- dipole

transfer of e^-

5. Using periodic trends, predict the order of increasing electronegativity in each of the following groups of elements

a) Na, K, Rb

Rb < K < Na

b) B, O, Ga

Ga < B < O

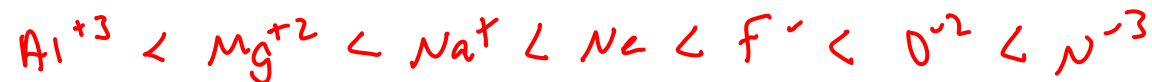
c) F, Cl, Br

Br < Cl < F

d) S, O, F

S < O < F

6. List 5 ions that are isoelectronic to neon and order them by increasing size



Formula	Lone pairs on central atom	Bonding pairs on central atom	Geometry	Hybridization	# of sigma bonds	# of pi bonds
BF ₃						
NH ₃						
CO ₃ ⁻²						
BrF ₅						
IF ₄ ⁺						
PCl ₅						

Formula	Lone pairs on central atom	Bonding pairs on central atom	Geometry	Hybridization	# of sigma bonds	# of pi bonds
SO ₂						
PO ₄ ⁻³						
H ₂ O						
ICl ₃						
SF ₆						
ICl ₄ ⁻						