

### CH301 More Problems to think about

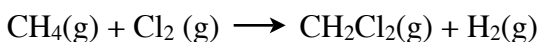
Rank the following in order of increasing crystal lattice energy:

Al<sub>2</sub>O<sub>3</sub>, LiCl, Na<sub>2</sub>O

Which of the following are ionic compounds

NO, Cl<sub>2</sub>, NaI, LiCl, CaCl<sub>2</sub>, CH<sub>3</sub>Cl, CCl<sub>4</sub>

Use the bond enthalpies in the text to calculate how much energy is either (absorbed or released) for the following reaction



Rank the following in terms of largest dipole

HF, HI, H<sub>2</sub>

Which of the following has a dipole (there may be more than one)

CH<sub>4</sub>, CHCl<sub>3</sub>, H<sub>2</sub>O, H<sub>2</sub>S, NH<sub>4</sub><sup>+</sup>, CO<sub>3</sub><sup>2-</sup>

For each of the following draw a Lewis Dot structure, give the electron and molecule geometry from VSEPR, identify the hybridization of the central atom, and give the number of sigma and pi bonds.

CO<sub>2</sub>, CH<sub>2</sub>Cl<sub>2</sub>, AlH<sub>3</sub>, I<sub>3</sub><sup>-</sup>, C<sub>2</sub>H<sub>4</sub>, NO<sub>3</sub><sup>-</sup>, PCl<sub>5</sub>

Identify the formal charges on each atom in

AlH<sub>3</sub>, NH<sub>2</sub><sup>-</sup>, SCN<sup>-</sup>

For N<sub>3</sub><sup>-</sup> do you think the structure with two double bonds or one single and one triple bond will contribute more to the true structure? Why?

Based on MO theory answer the following

Between F<sub>2</sub>, F<sub>2</sub><sup>+</sup>, and F<sub>2</sub><sup>-</sup> which do you think would have the highest bond order, strongest bond, longest bond length. Which (if any) would be paramagnetic?

In the following compound identify the bond angles and hybridization around each of the carbon atoms (note that lone pair electrons are not shown).

