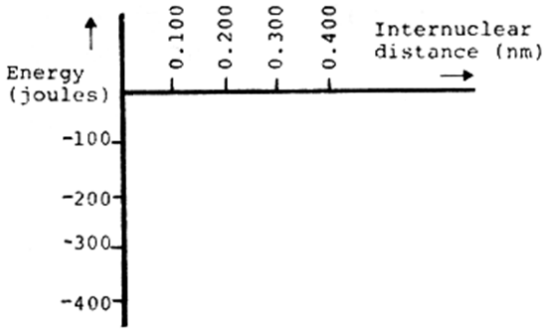
S-47, 48, 49, 50, 51

Name: **Period:** **Seat#:**

Directions: Try these problems. If you can DO them, check the box (☑).
If you CANNOT do them, write some notes TO YOURSELF about what you need to study to succeed at these problems.

S47 – Quick Check #1



☐ **Potential Energy Diagrams**

Sketch the potential energy involved as two hydrogen atoms approach each other.

As the two atoms get closer, the potential energy drops because of the _____

(attraction/repulsion) between the _____ and the _____.

The distance when the potential energy is a minimum is called

the _____ - _____ - _____.

☐ **Lewis Structures**

Draw the following ***Lewis Dot Diagrams.***

Be (ground state)	Be (bonding state)	Si (ground state)	Si (bonding state)

Draw the ***Lewis Dot Diagram*** for Calcium Chloride. This compound is _____ (covalent/ionic).

Explain how this bond was formed in terms of the electrons.

_____

_____

Draw the ***Lewis Dot Diagram*** for BeH_2. This compound is _____ (covalent/ionic).

Explain how this bond was formed in terms of the electrons.

_____

_____

State the octet rule: _____

_____

Is the compound BeH_2 obeying the octet rule? _____

S48 – Quick Check #2

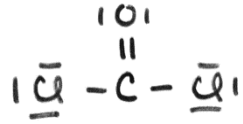
☐ **Lewis Structures**

Draw the **Lewis structure** for CH_3F.

Draw the **Lewis structure** for SO_2.

☐ **Formal Charge**

Determine the **formal charge** for each atom in $COCl_2$:

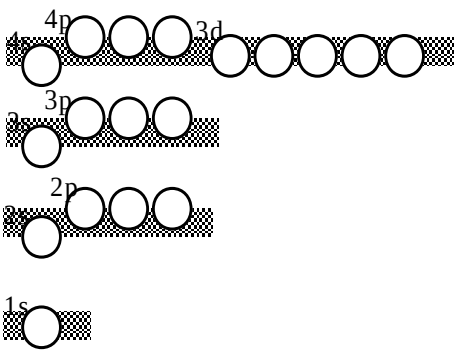


Draw the **Lewis structure** for CO_2.
Then determine the **formal charge** ~~and **oxidation number**~~ of C in CO_2.

S49 – Quick Check #3

☐ **Orbital Diagrams**

Fill in the orbital diagram for bromine.



Struggled? Got some wrong? Do some self-study!

☐ **Mixed Problems**

Write the ***short form electron configuration*** for Bromine: [Ar] _____

Bromine can make five bonds in molecules such as BrF_5 Draw the Lewis dot structure for BrF_5.

Determine the ***formal charge*** for each atom in BrF_5 molecule. Br = _____ F = _____

Consider the central bromine atom in BrF_5:

# of bonded atoms = ____ *# of lone pairs* = ____ Steric Number = ____

What is the ***Electron-Pair Geometry*** of BrF_5? _____

What is the ***Molecular Geometry*** of BrF_5? _____

S50 – Quick Check #4

☐ **Lewis Structures**

Using VSEPR Theory, name and sketch the shape of the following molecules.
For extra practice identify formal charges and the electron and molecular geometries of the center atoms.

1. N_2	2. H_2O	3. CO_2
4. NH_3	5. CH_4	6. SO_3
7. HF	8. CH_3OH	9. H_2S
10. I_2	11. $CHCl_3$	12. O_2

Struggled? Got some wrong? Do some self-study!

S51 – Quick Check #5

☐ Mixed Problems

Draw the Lewis Structure for BF3. Try to draw it in a way that takes into account the three dimensional shape and bond angles based on VSEPR theory. If applicable, correctly place the symbols δ+ and δ- around your drawing to represent any net dipole that may exist.

Based on VSEPR theory, what shape would you assign to the molecule, BF_3?

The B-F bond is classified as _____ (Ionic/Polar-Covalent/Non-Polar Covalent)

The molecule, BF_3, _____ have a net dipole moment. (does/does not)

The molecule, BF_3, is _____ (polar/non-polar)
Explain the reasoning for your answer:

☐ Bond Energy

Balance the following equation and calculate the Energy of Formation (ΔH_f) of NH_3 using the bond energies provided. Write the energy term on the correct side of the equation.

$$N_2 \quad + \quad H_2 \quad \rightarrow \quad NH_3$$

This reaction is _____ (endothermic/exothermic).

Table 9.9 • Some Average Single- and Multiple-Bond Energies (kJ/mol)

	H	C	N	O	F	Si	P	S	Cl	Br	I
H	**436**	**413**	**391**	**463**	**565**	**318**	**322**	**347**	**432**	**366**	**299**

Multiple Bonds	N≡N	945