**Polarity and Hybridization Worksheet**

1. How is a molecular orbital different from an atomic orbital?
2. What is the difference between polarity and a dipole?
3. Use hybridization to explain the bonding in methane CH4 and name the molecular orbital. (show your work)
4. What bond type is *sp3* hybridization, *sp2* hybridization, and *sp* hybridization?

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| --- | --- | --- | --- |
| Bond |  | Electronegativity Calculation | Draw bond with partial charges |
| H-H | Polar bond or Non polar |  |  |
| H-O | Polar bond or Non polar |  |  |
| H-F | Polar bond or Non polar |  |  |
| Br-Br | Polar bond or Non polar |  |  |
| H-Cl | Polar bond or Non polar |  |  |
| H-N | Polar bond or Non polar |  |  |

1. Determine whether each of the following bonds would be polar or nonpolar, and if polar indicate the polarity. Do the calculation for each:
2. Determine the Dipole of each of the following molecules by drawing the dipole or writing no dipole.

**1**

1. Fill in the following chart:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ***Calculations:***1. ***Bonding Pair Calculation***
2. ***Polarity Calculation***
 | ***Molecular Geometry:*** | ***Molecular Structure:******Include bond angles and polarity.*** | ***Dipole Direction******Or*** ***Nonpolar*** | ***Hybridization Work*** | ***Molecular Orbital*** |
| **H2O** |  |  |  |  |  |  |
| **I2** |  |  |  |  |  |  |
| **CF4** |  |  |  |  |  |  |
| **NH3** |  |  |  |  |  |  |