Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**Chemical Bonding Study Guide**

**Vocabulary: Match the following vocabulary words with their definitions**

|  |  |
| --- | --- |
| 1. **Electron Cloud**

http://t0.gstatic.com/images?q=tbn:ANd9GcQVdI3wyVCCpr1tPB-iG8vgLDlreQKbQpP-h4Lpyry9hsqKwo8Z **\_\_\_\_\_\_\_** | 1. Atom that is no longer neutral because it has gained or lost electrons
 |
| 1. **Electron Dot Diagram**

http://www.ck12.org/flx/render/perma/resource/default/image/user%3Ack12editor/e43379e988b9aa041a596871624e7622.png **\_\_\_\_\_\_\_** | 1. Pure substance that contains two or more elements, created when atoms bond
 |
| 1. **Ion**

https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcT-77oFWObB1dxm6P0CGHQ-HeQw3JhUooQk_fSvtg16G9F94xy7 **\_\_\_\_\_\_\_** | 1. Neutral particle formed when atoms bond together
 |
| 1. **Molecule**

http://i579.photobucket.com/albums/ss236/mrchaize/Molecules/640px-water_molecule_3dsvg1.png **\_\_\_\_\_\_\_** | 1. Area where electrons travel around the nucleus
 |
| 1. **Compound**

http://wps.prenhall.com/wps/media/objects/165/169061/GIFS/AAAUASN0.JPG **\_\_\_\_\_\_\_** | 1. Element symbol surrounded by dots to show the number of valence electrons
 |
| 1. **Chemical Bond**

chemical bonding :) **\_\_\_\_\_\_\_** | 1. Chemical bond that holds atoms together by the attraction of opposite charges
 |
| 1. **Ionic Bond**

http://www.daviddarling.info/images/ionic_bonding.gif **\_\_\_\_\_\_\_** | 1. Chemical bond that holds atoms together by sharing electrons
 |
| 1. **Metallic Bond**

showing free electrons from the outer electron shells mingled with positively charged metal ions **\_\_\_\_\_\_\_** | 1. Chemical bond created when atoms share electrons unequally
 |
| 1. **Covalent Bond**

http://www.substech.com/dokuwiki/lib/exe/fetch.php?w=&h=&cache=cache&media=covalent_bonding.png **\_\_\_\_\_\_\_** | 1. Force that holds two atoms together
 |
| 1. **Polar Bond**

http://t3.gstatic.com/images?q=tbn:ANd9GcRQP-YXRqAg1iJHHRbQHIOtCBfBGDdhqoVP6vX117oTJ6H4DdemWQ **\_\_\_\_\_\_\_** | 1. Chemical bond that holds atoms together because the atoms are pooling their electrons
 |

**Skills and Concepts**

1. **Use the word bank to label the atom below.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Nucleus** | **Electron** | **Proton** | **Neutron** |



1.  **How many electrons fit in the first, second, third, fourth, and fifth energy levels**
* **First- 2**
* **Second-\_\_\_\_\_\_\_\_\_\_\_**
* **Third- \_\_\_\_\_\_\_\_\_\_\_**
* **Fourth-\_\_\_\_\_\_\_\_\_\_\_**
* **Fifth- 64**
1. **How can you use the periodic table to find the number of electrons in the valence level of an atom?**



* **Number each column on the periodic table of elements from 1 to 18**. Hydrogen (H) is at the top of column 1 and helium (He) is at the top of column 18. These are the element groups.
* For groups 1 and 2 look at the top of the table and use the group number
* For groups 13-18 look at the top of the table and use the second digit of the group number
* \*\*This method does not work for groups 3-12 (the transition metals)\*\*
1. **What makes an atom different from an ion and how does an atom become an ion? Use the words in the word bank to fill in the blanks below.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Particles** | **Neutral** | **Charged** | **Balances** |
| **Electrons** | **Ions** | **Protons** |  |

* Ions and atoms are both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but ions are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and atoms are neutral
* Atoms are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they have the same number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and electrons
* Atoms become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when they gain or lose \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because when the number of electrons changes the number of negatives no longer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the positives

**W**



|  |  |  |  |
| --- | --- | --- | --- |
| Electrons are gained or lost | Bond created by attraction of ions | Between metals and non-metals | Electrons are shared |
|  |  |  |  |
| Bond created when atoms merge into one molecule | Between two or more metalloids or non-metals | All bond atoms together | Bond atoms using electrons |
|  |  |  |  |
| Electrons are pooled | Bond created by the atoms attraction to the pool | Between two or more metals |  |

1. **What is the difference between an element and compound?**

|  |  |  |
| --- | --- | --- |
| **Matter** | **Bonded** | **Element** |

Although an element and a compound are both examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is made of only one kind of atom, while compounds are made of more than one kind of atom \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ together.

1. **Compare and contrast atoms and molecules: Write Atom, molecule, or both next to the following descriptions.**
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Neutral particles of matter
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Made up of protons, electrons, and neutrons
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Make up compounds
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Make up elements
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Made of more than one different kind of atom bonded together
1. **How is a polar bond different from a regular bond? Why?**

|  |  |  |  |
| --- | --- | --- | --- |
| **Evenly** | **Electrons** | **Neutral** | **Stronger** |
| **Positive** | **Unevenly** |  |  |

* In a regular bond the molecule is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_because electrons are being shared \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* In a polar bond the one side of the molecule is a little \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and one side is a little negative because electrons are being shared \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Polar bonds form when one atom in a molecule has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_pull on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_than the others.



