

Background

Thus far in chemistry we have learned that atoms are most stable when their outer-most energy level is full (eg., noble gases like He, Ne, Ar). A full outer shell usually has 8 electrons in it (except for H and He which have 2). We have also learned that an atom may acquire a valence shell like that of its closest noble gas in one of 3 ways: lose electrons; gain electrons; or share electrons. It is this that determines the type of compound that elements make.

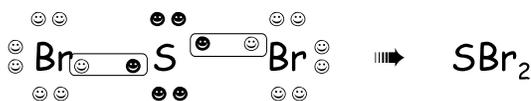
IONIC COMPOUNDS

The model with atoms losing/gaining electrons to become stable explains how ionic compounds (like sodium chloride below) are formed. The compound formed is called an ionic compound because it is made up of positive and negative ions that have resulted from the transfer of electrons from a metal to a nonmetal. The positive and negative ions are attracted to each other because they have opposite charges. Ionic compounds dissolve in water to form solutions that conduct electricity because they are made up of charged ions.



MOLECULAR COMPOUNDS

The model with atoms sharing pairs of electrons to become stable explains how molecular compounds (like sulfur dichloride below) are formed. The sharing of pairs of electrons is known as a covalent bond. Two atoms may share 1, 2, or 3 pairs of electrons. The compound formed is called a molecular compound because it contains neutral groups of atoms called molecules. Molecular compounds dissolve in water to form solutions that do not conduct electricity because they are made up of neutral molecules.



Task

Your task is to create a poster (11x17) that clearly and accurately shows how both an ionic and molecular compound forms. The poster layout/design is up to you but it must include the following:

- ❖ the chemical name and formula for each compound assigned to you
- ❖ whether the compound is ionic or molecular
- ❖ the ionic charge of each element
- ❖ two general chemical/physical properties each of an ionic and molecular compound
- ❖ Lewis dot diagrams that demonstrate how each stable compound is formed (see above)
- ❖ Bohr-Rutherford diagrams of the elements that make up each of your compounds
- ❖ the elements that make up your compound expressed in standard atomic notation

Limitations

1. You will be given two periods of class-time to complete the activity.
2. The poster will be due at the end of the period on the second day.
3. You will not be allowed to take the poster home to work on it.
4. If you miss a work period you will need to make up the work after school. I am here everyday until 4:30 pm unless I have a meeting - be sure to check with me first before making plans.
5. Crayons, markers, glue sticks, and coloured paper will be available for you to use. However, if you require other materials (such as a glue gun, paint, Cheerios, ...) make sure you bring them to class because you will not be allowed to wander the school looking for resources from other teachers/friends/...

Process

1. Select both an ionic and molecular compound. These will be assigned the first day in a random pattern.
2. Identify which is the ionic compound and which is the molecular compound.
3. Determine the information outlined above (❖) for each compound/element. You may need to refer to your notes!
4. Use a rough sketch to decide how you will organize the information requested on your poster, including any "creative" components and colour schemes.
5. Design your poster.
6. Submit your poster. Be sure to attach a marking scheme!

IONIC/MOLECULAR POSTER

Student: _____

COMPOUND	I	M
<ul style="list-style-type: none"> • Name & Formula (for each compound) • Charge/Combining Capacity (for each element) • Ionic/Molecular? • 2 General Properties each of Ionic/Molecular 	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
<ul style="list-style-type: none"> • Element Symbols • Valence Electrons • Transfer/Share • Works (correct # elements, makes sense, ...) 	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
<ul style="list-style-type: none"> • B-R Diagrams (p's, n's, e's & orbits) • Atomic Notation ($\overset{\uparrow}{\underset{\downarrow}{X}}$ format) 	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

✓ = correct/present/good ✗ = wrong/absent/poor

QUALITY OF PRESENTATION	0	1	2	3
<ul style="list-style-type: none"> • Creativity (the "wow" factor - colour, 3D, ...) • Neat & Organized (is it easy to find the info?) • Grammar & Spelling (-1 for each mistake) 	0	1	2	3

0 = poor 1 = good 2 = very good 3 = excellent

TOTAL

/35

Comments:

NOTE: Failure to submit a complete and polished poster on the assigned date will result in an incomplete being assigned. However, you will still be required to submit a complete and polished poster in order to demonstrate your understanding of the ministry expectations.

IONIC/MOLECULAR POSTER

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