

Unit 5 – Ionic Bonding Test Project

Use the color code diagram below to color each ion. Then cut out the ion shapes and combine the positive cations with the negative anions to create a balanced ionic bond. Glue each cation and anion combination onto the construction paper provided by your teacher. Write the formula and name under each compound.

Criteria for Test Grade:

- You must create at least **20 different ionic compounds**.
 - Combine the cations and anions so that the **net charge is zero**
 - write the **chemical formula** for every ionic bond created
 - write the **chemical name** for every ionic bond created
- You may create as many of each type as you like, as long as you:
 - include all oxidation numbers: **+1, -1, +2, -2, +3, -3, and +4**
 - include at least **6 different polyatomic ions** in your project
 - include at least **3 different transition metals** in your project

This project is due on _____ at the end of class.

Students will lose 10 points for each day it is late.

Periodic Table of the Elements
For Assessments Based on the 2010 Chemistry Standards of Learning

The periodic table is color-coded by groups and oxidation states. The groups are labeled 1 through 18. The oxidation states are indicated by numbers in colored boxes: +1 (pink), +2 (orange), +3 (yellow), +4 (light green), -1 (light blue), -2 (medium blue), -3 (dark blue), and 0 (white). The transition elements are labeled with their group numbers (3-10). The polyatomic ions are listed on the right side of the table.

Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	H 1 Hydrogen																	He 2 Helium
2	Li 3 Lithium	Be 4 Beryllium											B 5 Boron	C 6 Carbon	N 7 Nitrogen	O 8 Oxygen	F 9 Fluorine	Ne 10 Neon
3	Na 11 Sodium	Mg 12 Magnesium											Al 13 Aluminum	Si 14 Silicon	P 15 Phosphorus	S 16 Sulfur	Cl 17 Chlorine	Ar 18 Argon
4	K 19 Potassium	Ca 20 Calcium	Sc 21 Scandium	Ti 22 Titanium	V 23 Vanadium	Cr 24 Chromium	Mn 25 Manganese	Fe 26 Iron	Co 27 Cobalt	Ni 28 Nickel	Cu 29 Copper	Zn 30 Zinc	Ga 31 Gallium	Ge 32 Germanium	As 33 Arsenic	Se 34 Selenium	Br 35 Bromine	Kr 36 Krypton
5	Rb 37 Rubidium	Sr 38 Strontium	Y 39 Yttrium	Zr 40 Zirconium	Nb 41 Niobium	Mo 42 Molybdenum	Tc 43 Technetium	Ru 44 Ruthenium	Rh 45 Rhodium	Pd 46 Palladium	Ag 47 Silver	Cd 48 Cadmium	In 49 Indium	Sn 50 Tin	Sb 51 Antimony	Te 52 Tellurium	I 53 Iodine	Xe 54 Xenon
6	Cs 55 Cesium	Ba 56 Barium	La 57 Lanthanum	Hf 72 Hafnium	Ta 73 Tantalum	W 74 Tungsten	Re 75 Rhenium	Os 76 Osmium	Ir 77 Iridium	Pt 78 Platinum	Au 79 Gold	Hg 80 Mercury	Tl 81 Thallium	Pb 82 Lead	Bi 83 Bismuth	Po 84 Polonium	At 85 Astatine	Rn 86 Radon
7	Fr 87 Francium	Ra 88 Radium	Ac 89 Actinium	Rf 104 Rutherfordium	Db 105 Dubnium	Sg 106 Seaborgium	Bh 107 Bohrium	Hs 108 Hassium	Mt 109 Meitnerium									

Polyatomic Ions

OH ⁻¹	ClO ⁻¹
NO ₃ ⁻¹	NO ₂ ⁻¹
CN ⁻¹	C ₂ H ₃ O ₂ ⁻¹
CO ₃ ⁻²	HCO ₃ ⁻¹
SO ₄ ⁻²	PO ₄ ⁻³
CrO ₄ ⁻²	NH ₄ ⁺¹

Unit 5 – Ionic Bonding Test Project Rubric

Criteria	Grading Scale			
Appropriate Use of Time <i>Playing on cell phones, talking without working on project, or gaming on computers will result in a score of 0 for this section. Parents will be notified immediately.</i>	10 Excellent – Focused on getting the project done. Always on task. Helped clean up.	7.5 Good – Focused on getting the project done. Mostly on task. Helped clean up.	5 Satisfactory – Got the project done but was off task at times. Did not help clean up.	0 - 2.5 Needs Improvement Did not use class time appropriately. Did not help clean up.
Color Code Ions were colored in based on color coding chart provided in the project criteria.	15 Excellent – All ions were colored according to the chart given in the instructions.	10 Good – Most ions were colored according to the chart given in the instructions. Only 1-2 errors were found.	5 Satisfactory – Some ions were colored according to the chart given in the instructions. Only 2-3 errors were found.	0 - 2.5 Needs Improvement - Needs Improvement - Ions were not colored according to the instructions. Contained 4 or more errors.
Ionic Bonding Project included 20 different ionic bonds, including 6 with polyatomic ions and 3 with transition metals. SCI.9-12.CH.3.d bonding types;	25 Excellent – All ionic bonds were balanced and all ion combinations were included in the project.	20 Good – All ionic bonds were balanced but 1 ion combination was missing from the project.	15 Satisfactory – All ionic bonds were balanced but 2 ion combinations were missing from the project.	0 - 10 Needs Improvement - Some ionic bonds were not balanced and/or 3 or more ion combination were missing from the project.
Chemical Formula Ionic formulas were written using IUPAC rules. SCI.9-12.CH.3.c writing chemical formulas;	25 Excellent – All ionic formulas were written according to the IUPAC rules.	20 Good – Most ionic formulas were written according to the IUPAC rules. Only 1 error was found.	15 Satisfactory – Some ionic formulas were written according to the IUPAC rules. Only 2 errors were found.	0 - 10 Needs Improvement - Ionic formulas were not written according to the IUPAC rules. Three or more errors were found.
Chemical Name Ionic names were written based on IUPAC rules. SCI.9-12.CH.3.a nomenclature;	25 Excellent – All ionic names were written according to the IUPAC rules.	20 Good – Most ionic names were written according to the IUPAC rules. Only 1 error was found.	15 Satisfactory – Some ionic names were written according to the IUPAC rules. Only 2 errors were found.	0 - 10 Needs Improvement - Ionic names were not written according to the IUPAC rules. Three or more errors were found.

Total Score: _____ / 100

Comments:
