

Honors Chemistry Summer Assignment Packet

Congratulations on making the decision to take Honors Chemistry! This course will move at a fast pace. This Summer Assignment Packet is to be completed before school begins this fall and will help you to be more successful for the first unit of this class.

In Honors Chemistry, you will need to memorize element names and symbols (including their proper spelling), ion names, symbols and charges, as well as other formulas and equations throughout the year. The first few pages of this packet list the things you must memorize for the first unit. The last few pages are for you to practice solving Algebra 1 equations. For you to be successful in this class, it is essential that you review and understand the Algebra 1 skills of solving for an unknown variable as well as combining like terms.

When working any problems in Honors Chemistry, it is required that you **SHOW ALL WORK!** Many points on the Free Response Questions are awarded for simply showing the equation you used and correctly showing every step of your work. There is usually just one point awarded for a correct answer, and none if there is no work to go with it. Practice writing clearly and neatly. You will be tested on the information in this packet in the first unit.

Elements to Memorize for Honors Chemistry

Memorize the names and symbols of these 60 elements.

You will be tested on the correct Spelling of the Name and the Symbol!

| | | | |
|---------------|--------------|----------------|----------------|
| Hydrogen (H) | Helium (He) | Lithium (Li) | Beryllium (Be) |
| Boron (B) | Carbon (C) | Nitrogen (N) | Oxygen (O) |
| Fluorine (F) | Neon (Ne) | Sodium (Na) | Magnesium (Mg) |
| Aluminum (Al) | Silicon (Si) | Phosphorus (P) | Sulfur (S) |
| Chlorine (Cl) | Argon (Ar) | Potassium (K) | Calcium (Ca) |

| | | | |
|-------------|---------------|----------------|----------------|
| Barium (Ba) | Iodine (I) | Radium (Ra) | Bromine (Br) |
| Iron (Fe) | Silver (Ag) | Cadmium (Cd) | Manganese (Mn) |
| Tin (Sn) | Chromium (Cr) | Mercury (Hg) | Tungsten (W) |
| Copper (Cu) | Nickel (Ni) | Uranium (U) | Plutonium (Pu) |
| Zinc (Zn) | Lead (Pb) | Strontium (Sr) | Gold (Au) |

| | | | |
|----------------|----------------|-----------------|---------------|
| Scandium (Sc) | Titanium (Ti) | Vanadium (V) | Cobalt (Co) |
| Gallium (Ga) | Germanium (Ge) | Arsenic (As) | Selenium (Se) |
| Krypton (Kr) | Rubidium (Rb) | Molybdenum (Mo) | Antimony (Sb) |
| Tellurium (Te) | Xenon (Xe) | Cesium (Cs) | Cerium (Ce) |
| Platinum (Pt) | Bismuth (Bi) | Radon (Rn) | Francium (Fr) |

Honors Chemistry Ions You Must Memorize

(memorize the name and formula with charge – spelling counts!)

Polyatomic

| | | |
|--------------|--------------------------------|--|
| Nitrate | $(\text{NO}_3)^{1-}$ | |
| Hydroxide | $(\text{OH})^{1-}$ | |
| Chlorate | $(\text{ClO}_3)^{1-}$ | |
| Permanganate | $(\text{MnO}_4)^{1-}$ | |
| Sulfate | $(\text{SO}_4)^{2-}$ | Cyanide $(\text{CN})^{1-}$ |
| Carbonate | $(\text{CO}_3)^{2-}$ | Bicarbonate $(\text{HCO}_3)^{1-}$ |
| Chromate | $(\text{CrO}_4)^{2-}$ | Acetate $(\text{C}_2\text{H}_3\text{O}_2)^{-}$ |
| Dichromate | $(\text{Cr}_2\text{O}_7)^{2-}$ | Peroxide O_2^{2-} |
| Phosphate | $(\text{PO}_4)^{3-}$ | Ammonia NH_3 |
| Ammonium | $(\text{NH}_4)^{1+}$ | Methane CH_4 |
| Hydronium | $(\text{H}_3\text{O})^{1+}$ | Water H_2O |










Metallic Ions

(these transition metals only have a single possible charge
memorize the symbol, charge and spelling for each)

| | |
|--------------------|------------------|
| Silver (Argentous) | Ag^{1+} |
| Zinc | Zn^{2+} |
| Cadmium | Cd^{2+} |
| Aluminum | Al^{3+} |
| Scandium | Sc^{3+} |

Memorize these Safety Symbols and their Meanings

GHS Pictograms and Hazards

| | | |
|--|--|--|
| Health Hazard  <ul style="list-style-type: none">▪ Carcinogen▪ Mutagenicity▪ Reproductive Toxicity▪ Respiratory Sensitizer▪ Target Organ Toxicity▪ Aspiration Toxicity | Flame  <ul style="list-style-type: none">▪ Flammables▪ Pyrophorics▪ Self-Heating▪ Emits Flammable Gas▪ Self-Reactives▪ Organic Peroxides | Exclamation Mark  <ul style="list-style-type: none">▪ Irritant (skin and eye)▪ Skin Sensitizer▪ Acute Toxicity▪ Narcotic Effects▪ Respiratory Tract Irritant▪ Hazardous to Ozone Layer (Non-Mandatory) |
| Gas Cylinder  <ul style="list-style-type: none">▪ Gases Under Pressure | Corrosion  <ul style="list-style-type: none">▪ Skin Corrosion/Burns▪ Eye Damage▪ Corrosive to Metals | Exploding Bomb  <ul style="list-style-type: none">▪ Explosives▪ Self-Reactives▪ Organic Peroxides |
| Flame Over Circle  <ul style="list-style-type: none">▪ Oxidizers | Environment  <ul style="list-style-type: none">▪ Aquatic Toxicity | Skull and Crossbones  <ul style="list-style-type: none">▪ Acute Toxicity (fatal or toxic) |

Disposal Alert



This symbol appears when care must be taken to dispose of materials properly.

Biological Hazard



This symbol appears when there is danger involving bacteria, fungi, or protists.

Open Flame Alert



This symbol appears when use of an open flame could cause a fire or an explosion.

Thermal Safety



This symbol appears as a reminder to use caution when handling hot objects.

Sharp Object Safety



This symbol appears when a danger of cuts or punctures caused by the use of sharp objects exists.

Fume Safety



This symbol appears when chemicals or chemical reactions could cause dangerous fumes.

Electrical Safety



This symbol appears when care should be taken when using electrical equipment.

Plant Safety



This symbol appears when poisonous plants or plants with thorns are handled.

Animal Safety



This symbol appears whenever live animals are studied and the safety of the animals and the students must be ensured.

Radioactive Safety



This symbol appears when radioactive materials are used.

Clothing Protection Safety



This symbol appears when substances used could stain or burn clothing.

Fire Safety



This symbol appears when care should be taken around open flames.

Explosion Safety



This symbol appears when the misuse of chemicals could cause an explosion.

Eye Safety



This symbol appears when a danger to the eyes exists. Safety goggles should be worn when this symbol appears.

Poison Safety



This symbol appears when poisonous substances are used.

Chemical Safety



This symbol appears when chemicals used can cause burns or are poisonous if absorbed through the skin.

We will be combining Chemistry concepts with solving Algebra 1 type problems this year. Therefore, it is essential that you review and know how to solve the following types of problems. You MUST SHOW ALL STEPS! DO NOT USE a Math Solving App!

Solve the following equations. SHOW ALL WORK

8) Rearrange the following equation to solve for x $y = \frac{1}{4}xa^3$

9) Rearrange the following equation to solve for c $a = \frac{2(b+c)}{d}$

10) Solve for m $10m + 43m + 20 = -140 + 11m$

Solve for the unknown variable in the following equations. Give your answer as a decimal value, not a fraction. SHOW ALL WORK

11) $-9p - 8 = 7p - 14$

12) $\frac{7}{x} = \frac{20-6}{3}$

13) $0.75x + 2 = 0.375x - 4$

14) $1.5 + 0.6x = 4.5 + 0.8x$

15) $1.6b - 1 = 5.2b - 8.2$

16) $\frac{1}{4}x + \frac{5}{2}x = 4$

17) $4 * \left(\frac{3.66}{c}\right) = \frac{22-8}{3}$

18) $24 * \left(\frac{x+2}{8}\right) = \frac{144}{6} * \frac{2}{3}$

19) $(2x + 3) + (x - 4) = 0$

20) $y - \frac{4}{2}y + 5y - 71 = 1$

Solve each problem.

21) You would like to replace the carpet in 2 rooms of your house. The dimensions of your bedroom are 12.5 feet by 13.0 feet. The dimensions of your living room are 15.2 feet by 13.4 feet. The carpet you would like to buy is \$9.75 per square foot. Installation is an additional \$1.25 per square foot. How much will it cost to replace the carpet in the 2 rooms? If you have \$2400, do you have enough money to replace your carpet? **SHOW ALL WORK**

22) Brass is a mixture of two metals zinc and copper. A sample of brass weighs 52.3 grams. If 11.2% of the sample is made of zinc, what is the mass of the copper in grams?

23) How many liters of a 30% acid solution must be added to how many liters of a 70% acid solution in order to make 50 liters of a 40% acid solution?

24) Fill in the following Data table. **SHOW ALL WORK**

| <u>Mass</u> | <u>Volume</u> | <u>Density</u> |
|-------------|----------------------|-------------------------|
| 2.23 grams | 42.7 cm ³ | |
| | 64.7 cm ³ | 1.33 g/cm ³ |
| 4.22 grams | | 0.861 g/cm ³ |

25) You are given the following equation and variables. Solve for P. SHOW ALL WORK

$$L = 12000 \qquad L = \frac{2(L/W)}{P}$$

W = 125
P = ?

26) If $E=mc^2$ where Energy is E, mass is m and the speed of light is c (where $c = 2.99 \times 10^8$)
What is the mass if the energy is 5.66×10^3 ? SHOW ALL WORK

27) Given $(2a^3b) - (6b - 7ab^3)$ if $a=2$ and $b=3$, solve SHOW ALL WORK

28) Given $(2xy^2 + 4y - 3)$ if $x=1.25$ and $y=3.0$, solve SHOW ALL WORK

Create a line graph using the following data. Figure out your scale, make the graph use the entire gridded area, give the graph a Title and label the x and y axes. Plot this by hand. Pressure is the independent variable.

| Pressure in pKa | Volume in cm ³ |
|-----------------|---------------------------|
| 200 | 31 |
| 180 | 34 |
| 140 | 44 |
| 100 | 62 |
| 85 | 73 |
| 70 | 88 |
| 60 | 103 |

