

2021 AP Chemistry Summer Homework

Congratulations on your decision to take a challenging course such as AP Chemistry! This course will move at a fast pace and will cover a substantial amount of material. The primary goal of this course is to learn the necessary concepts and problem solving skills to perform well in the AP Chemistry exam.

AP Chemistry is a math oriented course. We will learn to speak the language of chemistry through a deep understanding and mastery of mathematical skills. We will work all year to build up your math skills and that will start with your summer work.

The attached summer assignment covers first-year chemistry topics that will **NOT** be taught in details in AP Chemistry. If it has been over a year since you took your first chemistry course or you took chemistry just recently, you are strongly encouraged to begin working on this assignment the week before school starts.

Regardless of how we return next school year, I commit to give my 100% dedication everyday to teach and I hope to see the same dedication from you to do your part.

If you have any questions during the summer, you are welcome to contact me via email at rsamuels@sscps.org

I hope you have an enjoyable summer and I look forward to having you next year as we embark on our chemistry adventure!

See you soon!



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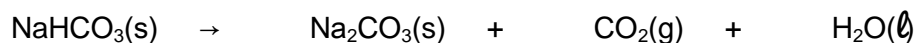
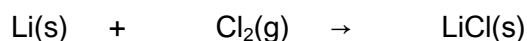
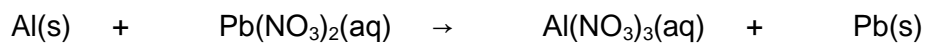
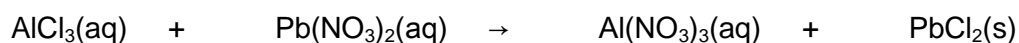
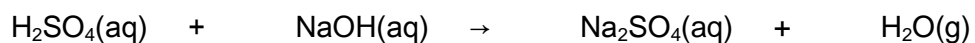
AP Chemistry Summer Homework

1. How many significant figures does the number 0.0908000 have?
2. Do the following calculation correctly for significant figures $765000 \times (12.55 - 12.25) =$
3. Convert 0.0000923 mm to nm
4. Complete the following table:

Name	Mass #	Atomic #	# of Protons	# of Neutrons	# of Electrons	Symbol
Gallium-70					31	
						${}_{15}^{31}\text{P}^{-3}$
Strontium-80					36	
						${}_{25}^{55}\text{Mn}^{+2}$

5. Calculate the atomic weight of a fictitious element with two naturally occurring isotopes: Uux-351 has a mass of 351.111 amu and an abundance of 78.05%, Uux-353 has a mass of 353.135 amu.
6. How many valence and core electrons does phosphorus have?
7. Is NaNO_3 ionic or covalent? How do you know?

14. Balance each of the following reactions, and identify the type of reaction each one is. (possible reaction types = combination, decomposition, double replacement, single replacement, combustion, acid-base neutralization)



15. Suppose that you have 10.0 g of C_2H_6

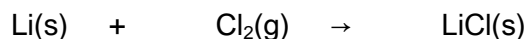
a) What is the molar mass of C_2H_6 ?

b) Convert 10.0 g of C_2H_6 to moles.

c) Calculate the number of molecules in 10.0 g of C_2H_6 .

d) How many atoms are in 10.0 g of C₂H₆?

16. Suppose that you react 10.0 g Li with 20.0 g Cl₂ according to the following unbalanced reaction:



- a) Determine the limiting reagent and the theoretical yield.
- b) Are your calculations consistent with the law of conservation of mass? Explain.
- c) If $R = 0.08206 \text{ L}\cdot\text{atm}\cdot\text{mol}^{-1}\text{K}^{-1}$, calculate the volume of 20.0 g Cl₂ at standard temperature and pressure (exactly 0 °C, 1 atm).
- d) Suppose that after the reaction is complete, you collect 22.2 g lithium chloride. Calculate the percent yield of the reaction.

AP Chem [Periodic Table](#)

AP Chem [Equation Sheet](#)

Videos to help if you forgot something. (I did not make these videos but just re-used them). You can also use any video you can find online.

Counting Significant Figures: <https://youtu.be/btXoAPefDIM?t=704>

Significant Figure Math: <https://youtu.be/BNAwalzi6d8>

Metric Prefixes: <https://youtu.be/AIYj9PxrHBM>

Protons, Neutrons, Electrons in Isotopes: https://youtu.be/cbRNL_Pr5LA?t=977

and: https://youtu.be/_b3qXxXz7So?t=1058

Atomic Weight: <https://youtu.be/ejeZxB-myEM>

Valence and Core: <https://youtu.be/HwkVUw63hds?t=602> and:

<https://youtu.be/c1QFKk6yHCE>

Naming Chemicals: <https://youtu.be/xSBYpaRze3Y>

Lewis Diagrams: <https://youtu.be/cluXI7o6mAw> and: <https://youtu.be/qwqXAlvNxsU>

Mass Percent: <https://youtu.be/pXN6rJINXsq>

The Mole: <https://youtu.be/qYuq--5fW5M>

Molarity: <https://youtu.be/KLjWa9cE2uk>

Stoichiometry: https://www.youtube.com/playlist?list=PL8mtSf_9o-8VAkZg0Ps7_Jaliy_1AkPh8