

## A.P. Chemistry Summer Assignment 2020

Due Date: First day of class in August

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Access this free online text: <https://openstax.org/details/books/chemistry-2e>

You might have to make an account, but it's free.

**Reading notes** (any format) for Chapters 1, 2, 3, and 4 from the online text. Label each section clearly.

**Practice problems.** Practice problems from the AP Chemistry textbooks will be assigned once we return in the fall and you can check out the text. No practice problems need to be completed over the summer.

Memorize the name, formula, and charge of the following common polyatomic ions. You will be expected to know these by heart for every quiz and test all year.

1- charge		2- charge		3- charge	
Formula	Name	Formula	Name	Formula	Name
H <sub>2</sub> PO <sub>4</sub> <sup>1-</sup>	Dihydrogen phosphate	HPO <sub>4</sub> <sup>2-</sup>	Hydrogen phosphate	PO <sub>4</sub> <sup>3-</sup>	Phosphate
C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> <sup>1-</sup>	Acetate	C <sub>2</sub> O <sub>4</sub> <sup>2-</sup>	Oxalate	PO <sub>3</sub> <sup>3-</sup>	Phosphite
HSO <sub>3</sub> <sup>1-</sup>	Hydrogen sulfite	SO <sub>3</sub> <sup>2-</sup>	Sulfite		
HSO <sub>4</sub> <sup>1-</sup>	Hydrogen sulfate*	SO <sub>4</sub> <sup>2-</sup>	Sulfate		
HCO <sub>3</sub> <sup>1-</sup>	Hydrogen carbonate*	CO <sub>3</sub> <sup>2-</sup>	Carbonate		
NO <sub>2</sub> <sup>1-</sup>	Nitrite	CrO <sub>4</sub> <sup>2-</sup>	Chromate	<b>1+ charge</b>	
NO <sub>3</sub> <sup>1-</sup>	Nitrate	Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	Dichromate	<b>Formula</b>	<b>Name</b>
CN <sup>1-</sup>	Cyanide	SiO <sub>3</sub> <sup>2-</sup>	Silicate	NH <sub>4</sub> <sup>1+</sup>	Ammonium
OH <sup>1-</sup>	Hydroxide	O <sub>2</sub> <sup>2-</sup>	Peroxide		
MnO <sub>4</sub> <sup>1-</sup>	Permanganate			<b>2+ charge</b>	
ClO <sup>1-</sup>	Hypochlorite			<b>Formula</b>	<b>Name</b>
ClO <sub>2</sub> <sup>1-</sup>	Chlorite			Hg <sub>2</sub> <sup>2+</sup>	Mercury (I)
ClO <sub>3</sub> <sup>1-</sup>	Chlorate				
ClO <sub>4</sub> <sup>1-</sup>	Perchlorate				
SCN <sup>1-</sup>	Thiocyanate				
BrO <sub>3</sub> <sup>1-</sup>	Bromate				
BrO <sub>2</sub> <sup>1-</sup>	Bromite				

\*hydrogen sulfate is commonly called bisulfate, hydrogen carbonate is commonly called bicarbonate

Memorize the following solubility rules. You will be expected to be familiar with these all year.

Rule	Important Exceptions
1. All nitrate (NO <sub>3</sub> <sup>1-</sup> ), nitrite (NO <sub>2</sub> <sup>1-</sup> ), chlorate (ClO <sub>3</sub> <sup>1-</sup> ) and perchlorate (ClO <sub>4</sub> <sup>1-</sup> ) salts are soluble.	AgNO <sub>3</sub> and KClO <sub>4</sub> are considered slightly soluble.
2. Essentially, all alkali metal (Li <sup>+</sup> , Na <sup>+</sup> , K <sup>+</sup> , Rb <sup>+</sup> , Cs <sup>+</sup> ) and ammonium (NH <sub>4</sub> <sup>+</sup> ) salts are soluble.	Some Li <sup>+</sup> are insoluble, with Li <sub>3</sub> PO <sub>4</sub> being the most common example.
3. Most halogen (Cl <sup>1-</sup> , Br <sup>1-</sup> , I <sup>1-</sup> ) salts are soluble.	Ag <sup>+</sup> , Pb <sup>2+</sup> , Hg <sub>2</sub> <sup>2+</sup> , Cu <sup>+</sup> , Tl <sup>+</sup> (Pb <sup>2+</sup> halogens are soluble in hot water.) HgBr <sub>2</sub> is slightly soluble.
4. Most acetate (C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> <sup>1-</sup> ) salts are soluble.	Ag <sup>+</sup> , Hg <sub>2</sub> <sup>2+</sup>
5. Most sulfate (SO <sub>4</sub> <sup>2-</sup> ) salts are soluble.	Ca <sup>2+</sup> , Sr <sup>2+</sup> , Ba <sup>2+</sup> , Ra <sup>2+</sup> , Pb <sup>2+</sup> , Ag <sup>+</sup> , Hg <sup>2+</sup> (Some sources consider calcium sulfate and silver sulfate to be slightly soluble.)
6. Many sulfides (S <sup>2-</sup> ) are insoluble.	All alkali metal and alkaline earth (Be <sup>2+</sup> , Mg <sup>2+</sup> , Ca <sup>2+</sup> , Sr <sup>2+</sup> , Ba <sup>2+</sup> , Ra <sup>2+</sup> ) sulfides are soluble. Ammonium sulfide is soluble. (Some sources consider MgS, CaS and BaS to be slightly soluble.)
7. Most borates (BO <sub>3</sub> <sup>2-</sup> ), carbonates (CO <sub>3</sub> <sup>2-</sup> ), chromates (CrO <sub>4</sub> <sup>2-</sup> ), phosphates (PO <sub>4</sub> <sup>3-</sup> ), and sulfites (SO <sub>3</sub> <sup>2-</sup> ) are slightly soluble.	MgCrO <sub>4</sub> is soluble, MgSO <sub>3</sub> is slightly soluble.
8. Most hydroxide (OH <sup>1-</sup> ) salts are insoluble	Alkali metal hydroxides are soluble. Ba <sup>2+</sup> , Sr <sup>2+</sup> , Ca <sup>2+</sup> , Tl <sup>+</sup> are considered slightly soluble.