

Day 1 Review



Some basic things you hopefully remember from Chemistry class. Answer the best you can!
Answers posted on my website. Not a grade, but you will have a quiz similar to this on Monday

- How many sig figs does 0.003080 have? 4
- Put .003080 into scientific notation: 3.080×10^{-3}
- How many sig figs does 20 students have? ∞
- Calculate the following using correct number of significant digits $310 / 0.0138$ 22,000
(Note: 310 has 2 sig figs, 0.0138 has 3 sig figs)
- Convert 15.013 centimeters to inches (remember, 2.54cm = 1in)

$$\frac{15.013 \text{ cm}}{2.54 \text{ cm}} \times \frac{1 \text{ in}}{1} = \boxed{5.91 \text{ in}}$$

- Convert 4.180 leagues into cm (also remember, 12in=1ft, 5280ft=1mi, 3mi=1league)

$$\frac{4.180 \text{ leagues}}{1 \text{ league}} \times \frac{3 \text{ mi}}{1 \text{ league}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{12 \text{ in}}{1 \text{ ft}} = \boxed{794,500 \text{ in}}$$

Molecular Compounds Naming

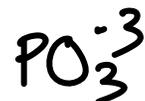
Complete the Table... remember this use names like mono, ... di... tri... etc

Formula	Name
B ₆ Si	1. hexaboron monosilicide
PI ₃	2. phosphorus triiodide
ClO ₂	3. chlorine dioxide
SbBr ₃	4. antimony tribromide
5. P ₄ S ₅	tetraphosphorus <u>pent</u> sulfide
6. Si ₇ O ₈	<u>hept</u> silicon <u>oct</u> oxide
7. Si ₂ Br ₁₀	<u>di</u> silicon <u>dec</u> abromide
8. CH ₄	methane

Ionic Compound Naming

Fill in the Table. Use your periodic table for transition metal charges

Formula	Name
9. $HgCl_2$	mercuric chloride
10. $Cr_2(CO_3)_3$	chromic carbonate
11. $MnSO_3$	manganous sulfite
12. CoF_3	cobalt (III) fluoride
13. $Ca_3(PO_3)_2$	calcium phosphite
14. $NH_4C_2H_3O_2$	ammonium acetate
15. $FeBr_2$	Iron (II) bromide
16. Na_3P	Sodium phosphide
17. $LiNO_3$	lithium nitrate
18. $RbClO_2$	rubidium chlorite
19. AlN	aluminum nitride
20. CrS	chromium(II) sulfide or chromous sulfide
21. FeO	iron(II) oxide ferrous oxide
22. Fe_2O_3	iron(III) oxide ferric oxide
23. KOH	potassium hydroxide
24. $CaSO_4$	calcium sulfate



Please review sig figs, conversions and naming before Monday as you will have a quiz then.

Also, if this review was not fun or something that you enjoyed in any regard, you might consider dropping this class unless you really need it for your college career. :)

Uncertainty in Measurements

accuracy - how close to true value
ex) balance can not be zeroed

precision - how close a series of measurements are
- determined by instrument
big graduated cylinder = low precision
small graduated cylinder = more precision

489 mL + 3 drops of water = 489 mL
(not significant)

Significant Digits (Significant Figure)

- reporting precision of measurements
 - only 1 digit can be estimated
- ex) 400 is known, 80 is known, but 9 is estimated

489 mL
↑↑↑
↑ estimated ← 3 sig figs

sig fig - any known digit plus 1 estimated digit

How to Determine # Sig Figs

409,000 = 3 s.f.

0.0013020 = 5 s.f.

- non-zeros always count, zeros sometimes count

1) Decimal is Absent (not there)

- Ignore zeros on the RIGHT (Atlantic Zeros)

ex) 1,200,000 = 2 sig figs

ex) 48,890 = 4 s.f.

2) Decimal is Present (there)

- Ignore zeros on LEFT (Pacific Zeros)

ex) 0.00697 = 3 s.f.

ex) .0009060 = 4 s.f.

ex) 12.00 = 4 s.f.

3) Scientific Notation ... all digits are significant

ex) $6.60 \times 10^6 = 3 \text{ s.f.}$

ex) $9.0310 \times 10^{-4} = 5 \text{ s.f.}$
(| | | |)

4) Exact Number (counted or told "exact")

- infinite # of sig figs

ex) 13 eggs = infinite # sig figs

ex) 23 girls = infinite # s.f. (perfectly precise)

ex) 35,000 in crowd = 2 sig figs (estimate)

ex) 2.54 cm = 1 in (exact conversion) = infinite s.f.

Molecular Compound Naming

Binary Molecular Compounds

↳ Two nonmetal elements

→ no ionic charges

→ can bond in multiple ways

ex) CO_2 carbon dioxide

CO carbon monoxide

Molecular Prefixes

mono - 1

di - 2

tri - 3

tetra - 4

penta - 5

hexa - 6

hepta - 7

octa - 8

nona - 9

deca - 10

* 2nd element ends in "-ide"

ex)

Name

Formula

Carbon tetrachloride

CCl_4

tetraiodine nonoxide

I_4O_9

dinitrogen	monoxide	N_2O
nitrogen	trifluoride	NF_3
oxygen	difluoride	OF_2
fluorine	monoxide	FO

* mono is only used w/ 2nd element

Diatomic Molecules



→ just name of element + "molecule"

ex) N_2 = nitrogen molecule

Other Common Molecules

H_2O - water (not dihydrogen monoxide)

NH_3 - ammonia (not nitrogen trihydride)

CH_4 - methane (not carbon tetrahydride)

CHEMISTRY

Know your Ions!

Table 6.2

Ionic Charges of Representative Elements							
1A	2A	3A	4A	5A	6A	7A	0
Li ⁺	Be ²⁺			N ³⁻	O ²⁻	F ⁻	
Na ⁺	Mg ²⁺	Al ³⁺		P ³⁻	S ²⁻	Cl ⁻	
K ⁺	Ca ²⁺			As ³⁻	Se ²⁻	Br ⁻	
Rb ⁺	Sr ²⁺					I ⁻	
Cs ⁺	Ba ²⁺						

Ionic Charges
 Copper (1,2)
 Iron (2,3)
 Mercury (1,2)
 Lead (2,4)
 Tin (2,4)
 Chromium (2,3)
 Manganese (2,3)
 Cobalt (2,3)

Table 6.3

Formulas and Names of Common Metal Ions with More than One Ionic Charge		
Formula	Stock name	Classical name
Cu ⁺	Copper(I) ion	+1 Cuprous ion
Cu ²⁺	Copper(II) ion	+2 Cupric ion
Fe ²⁺	Iron(II) ion	+2 Ferrous ion
Fe ³⁺	Iron(III) ion	+3 Ferric ion
*Hg ²⁺	Mercury(I) ion	Mercurous ion
Hg ²⁺	Mercury(II) ion	Mercuric ion
Pb ²⁺	Lead(II) ion	Plumbous ion
Pb ⁴⁺	Lead(IV) ion	Plumbic ion
Sn ²⁺	Tin(II) ion	Stannous ion
Sn ⁴⁺	Tin(IV) ion	Stannic ion
Cr ²⁺	Chromium(II) ion	Chromous ion
Cr ³⁺	Chromium(III) ion	Chromic ion
Mn ²⁺	Manganese(II) ion	Manganous ion
Mn ³⁺	Manganese(III) ion	Manganic ion
Co ²⁺	Cobalt(II) ion	Cobaltous ion
Co ³⁺	Cobalt(III) ion	Cobaltic ion

*A diatomic elemental ion.

Table 6.4

Common Polyatomic Ions					
1- charge		2- charge		3- charge	
Formula	Name	Formula	Name	Formula	Name
H₂PO₄⁻	Dihydrogen phosphate	HPO₄²⁻	Hydrogen phosphate	PO ₃ ³⁻	Phosphite
C ₂ H ₃ O ₂ ⁻	Acetate	C₂O₄²⁻	Oxalate	PO ₄ ³⁻	Phosphate
HSO₃⁻	Hydrogen sulfite	SO ₃ ²⁻	Sulfite		
HSO₄⁻	Hydrogen sulfate	SO ₄ ²⁻	Sulfate		
HCO₃⁻	Hydrogen carbonate	CO ₃ ²⁻	Carbonate		
NO ₂ ⁻	Nitrite	CrO ₄ ²⁻	Chromate		
NO ₃ ⁻	Nitrate	Cr ₂ O ₇ ²⁻	Dichromate		
CN ⁻	Cyanide	SiO₃²⁻	Silicate		
OH ⁻	Hydroxide				
MnO ₄ ⁻	Permanganate				
ClO ⁻	Hypochlorite				
ClO₂⁻	Chlorite				
ClO ₃ ⁻	Chlorate				
ClO ₄ ⁻	Perchlorate				

Crossed off ones are not needed for Day 2 Quiz on Monday