

## Stuff I Should Know (Page 2)

### Complex Ions & Common Ligands

Ligands	polar molecules & anions	$\text{NH}_3$ , $\text{H}_2\text{O}$ , $\text{OH}^-$ , $\text{CN}^-$ , $\text{Cl}^-$	Odd example: $\text{Fe}^{3+} + \text{SCN}^- \rightleftharpoons \text{FeSCN}^{2+}$
Central ions	transition metals and $\text{Al}^{3+}$	$\text{Ag}^+$ , $\text{Cu}^{2+}$ , $\text{Ni}^{2+}$ , $\text{Zn}^{2+}$ , etc. & $\text{Al}^{3+}$	
Examples	usually twice the number of ligands as the charge on the central ion. Key Words: "excess, concentrated"	$\text{Ag}(\text{CN})_2^-$ , $\text{Cu}(\text{NH}_3)_4^{2+}$ , $\text{Ni}(\text{OH})_4^{2-}$ , $\text{Zn}(\text{NH}_3)_4^{2+}$ , $\text{Al}(\text{OH})_4^-$	Reaction with Acid: $\text{Cu}(\text{NH}_3)_4^{2+} + \text{H}^+ \rightarrow \text{Cu}^{2+} + \text{NH}_4^+$

### Organic Chemistry & Functional Groups

alkanes $\text{C}_n\text{H}_{2n+2}$	alkenes $\text{C}_n\text{H}_{2n}$	alkynes $\text{C}_n\text{H}_{2n-2}$	aromatics (benzene) $\text{C}_6\text{H}_6$
alcohol  $\text{R}-\text{OH}$	aldehyde  $\text{R}-\overset{\text{O}}{\underset{\text{  }}{\text{C}}}-\text{H}$	ketone  $\text{R}-\overset{\text{O}}{\underset{\text{  }}{\text{C}}}-\text{R}$	ether  $\text{R}-\text{O}-\text{R}$
carboxylic acid  $\text{R}-\overset{\text{O}}{\underset{\text{  }}{\text{C}}}-\text{OH}$	ester  $\text{R}-\overset{\text{O}}{\underset{\text{  }}{\text{C}}}-\text{O}-\text{R}$	amine  $\text{R}-\text{NH}_2$	amide  $\text{R}-\overset{\text{O}}{\underset{\text{  }}{\text{C}}}-\text{NH}_2$
Substituted benzene:			
	ortho = 1,2	meta = 1,3	para = 1,4

### nuclear chem

alpha ${}^4_2\text{He}$
betalelectron ${}^0_{-1}\text{e}$
neutron ${}^1_0\text{n}$
positron ${}^0_{+1}\text{e}$

### $\Delta H$ $\Delta S$ Spont?

-	+	at all temps
+	+	high temps
-	-	low temps
+	-	no temps
Note: $\Delta S$ in J $\Delta G$ & $\Delta H$ in kJ		
<b><math>K_{sp}</math> &amp; Solubility, s</b>		
1:1	$K_{sp} = s^2$	
1:2	$K_{sp} = 4s^3$	
1:3	$K_{sp} = 27s^4$	
2:3	$K_{sp} = 108s^5$	

### Lewis Acids & Bases

$\text{BF}_3 + \text{NH}_3 \rightarrow \text{BF}_3\text{NH}_3$   
 acid anhydrides (oxides of nonmetals,  $\text{CO}_2$ )  
 basic anhydrides (oxides of metals,  $\text{MgO}$ )  
 $\text{MgO} + \text{CO}_2 \rightarrow \text{MgCO}_3$   
 decomposition reactions:  $\text{MgCO}_3 \rightarrow \text{MgO} + \text{CO}_2$   
 Strange Examples:  $\text{P}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow \text{H}_3\text{PO}_4$

### Strange Ions: (nitride, $\text{N}^{3-}$ ) (hydride, $\text{H}^-$ )



### Flame Test Colors

Barium – green
Sodium – yellow
Copper – blue (w/ green)
Potassium – lavender
Strontium – red
Lithium – red
Calcium – orange

### Quantum Numbers

n	1, 2, 3, ...
l	0 ... (n-1)
m	-l ... +l
$m_l$	+½, -½
s	0 = s, 1 = p, 2 = d, 3 = f

### Writing Lewis Structures

hint: use one valence electron to connect F's or Cl's then determine lone pairs (Ex:  $\text{XeF}_4$ )

### Product-Favored (Spontaneous) Reactions

$$\Delta G < 0 \quad E^\circ > 0 \quad K_{eq} > 1$$

### Properties Indicate Strength of Intermolecular Forces (IMF's)

IMF	BP	FP	$H_{vap}$	$H_{fus}$	VP
IMF	BP	FP	$H_{vap}$	$H_{fus}$	VP

### Orders of Reactions & Graphs That Give Straight Lines

0 Order	1 <sup>st</sup> Order	2 <sup>nd</sup> Order
$[\text{R}]$ vs. Time	$\ln[\text{R}]$ vs. Time	$1/[\text{R}]$ vs. Time
slope = -k	slope = -k	slope = -k

### Electrochemical Cells

anode	cathode
oxidation	reduction
- side	+ side
lower $E^\circ$	higher $E^\circ$
$e^-$ leave	$e^-$ enter

### Bond Orders

bond	B.O.	$\sigma$
single	1	$\sigma$
double	2	$\sigma + \pi$
triple	3	$\sigma + 2\pi$

### $\text{SN}$ & hybridization & shape

Steric Number	hybridization	basic shape
1	s	—
2	sp	linear
3	sp <sup>2</sup>	$\Delta$ planar
4	sp <sup>3</sup>	tetrahedral
5	sp <sup>3</sup> d	$\Delta$ bipyramidal
6	sp <sup>3</sup> d <sup>2</sup>	octahedral

### IMF's

London	nonpolar molecules, ex: $\text{CH}_4$ , He
dipole-dipole	polar molecules, ex: $\text{H}_2\text{S}$ , $\text{SO}_2$
hydrogen bonding	H-F, H-O-, H-N-, $\text{NH}_3$ , $\text{H}_2\text{O}$ amines and alcohols
metallic	metals, Ag, Pb
ionic	salts, $\text{NaCl}$ , $\text{CaCO}_3$ (Note: "ates" contain covalent bonds)
covalent network	C (graphite), C (diamond), $\text{SiO}_2$ , WC, Si, SiC (Note: graphite = London, too)

### Activity of Metals (Four Groups)

Metals	React with...
Groups I & II	$\text{H}_2\text{O}$ ex: $\text{Li} + \text{H}_2\text{O} \rightarrow \text{Li}^+ + \text{OH}^- + \text{H}_2$
all others	Non-oxidizing Acid, ex: $\text{HCl}$ $\text{Zn} + 2\text{HCl} \rightarrow \text{H}_2 + \text{ZnCl}_2$
Cu, Ag, Hg	Oxidizing Acid, $\text{HNO}_3$ or $\text{H}_2\text{SO}_4$ (conc.) $\text{Cu} + \text{HNO}_3 \rightarrow \text{NO}_2 + \text{H}_2\text{O} + \text{Cu}^{2+}$
Au, Pt, Ir	Aqua Regia ( $\text{HNO}_3$ + $\text{HCl}$ )

# Chem 1301 Cheat Sheet Review For Final

**Sabine Zange**



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**Federal Register** ,2013-12      **Safety and Health at Work** ,1999      *United Services and Empire Review* ,1923  
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web oct 7 2022 as we discussed yesterday i would like to request a formal leave of absence from my job for family reasons i plan to be away from november 2 2022 to december 30 2022 returning to work on january 3 2023 if approved i would be glad to help with a plan to cover my workload in my absence

**sick leave email to manager 31 sample emails simplestic** - Oct 06 2022

web aug 4 2023 subject sick leave request hi insert manager name i m writing to request sick leave for the next two days from date through date i have an emergency that requires medical attention please let me know if you have any questions or concerns thanks 26 hi i m writing to request sick leave i will be out of the office on date

**how to write a sick leave letter with template and example** - Jun 14 2023

web sep 30 2022 a sick leave letter is a formal document from you to your employer in which you can request to take an extended leave of absence from work because of illness receiving this letter informs the employer about your situation and how long you intend to

advanced sick leave u s office of personnel management - Jul 15 2023

web a request for advanced sick leave is essentially a request for sick leave therefore the medical documentation requirements for granting of sick leave apply for details on supporting evidence for the use of sick leave please see our fact sheet entitled sick leave general information

*advanced sick leave request une edu* - Feb 27 2022

web jul 17 2020 advanced sick leave request advanced sick leave request maximum of ten days of advanced sick leave not yet earned can be requested once you have been employed regular full time or half time by une for at least one year

**sick leave letter sick leave email sick leave request** - Mar 11 2023

web download the sick leave request letter and email samples in word format discover an example of an email that you can send to your manager to request sickness and your absence from the office for one day for fever and other reasons

*how to request a sick day with examples grammarly* - May 13 2023

web aug 18 2022 how to ask for sick leave whether you write a concise email or an in depth sick leave request depends on how many sick days you require and your medical circumstances regardless of how lengthy your sick day email or message is

it should include the following information

[sick leave letter samples for any situation resumehelp](#) - Dec 08 2022

web business letters sick leave letter samples if you need help with your sick leave letter you will find this article to be very helpful use our sample letter below as a guide in creating your letters and be sure to customize your letter for each job you re applying for

**how to write a sick leave letter with template and example** - Aug 16 2023

web jul 28 2023 a sick leave letter allows you to formally document your request to take an extended leave of absence from work because of illness it allows you to put the dates and details of your absence in writing so everyone understands why and for how long you ll be gone it will also serve as proof in your hr file for the future

**how to write a sick leave email with template and example** - Mar 31 2022

web mar 9 2023 a sick leave email is an email that an employee sends to notify the business they require sick leave to recover from an illness or injury employees usually send sick leave emails to their direct supervisor or manager to inform them of their condition and inability to complete their usual duties

*how to write a sick leave email message with examples* - May 01 2022

web jul 9 2022 a sick leave email allows you to formally document your request to take an extended leave of absence from work due to illness it allows you to indicate the dates and details of your absence in writing so everyone at work understands why and for how long you will be gone

**application for sick leave for office naukri com** - Dec 28 2021

web jul 31 2023 begin your letter by explicitly stating that you are requesting sick leave mention the specific dates you need to be absent from work provide a valid reason briefly explain the reason for your sick leave you don t need to go into great detail but mention the illness or health condition that necessitates your absence be honest and transparent

**how to ask for a leave of absence from work with examples** - Feb 10 2023

web mar 20 2023 make your initial leave of absence request in person or via video conference rather than in writing give sufficient advance notice before taking a leave of absence if possible work with

*request for advanced sick leave mrsc* - Aug 04 2022

web acknowledge and agree that any sick leave advanced to me is considered a debt and that beginning with the first pay period after the advancement is approved i am required to repay the city of bothell by applying my future sick leave accruals each pay period

*how to write a leave request email with examples indeed* - Jul 03 2022

web aug 31 2023 leave request due to health conditions you may consider taking some time off work for personal reasons

including health problems here is an example leave request message that you can use for it subject leave request due to health condition dear mark i m writing to ask for five days off from 15 to 19 november 2021

**how to write a leave of absence request with examples** - Apr 12 2023

web jul 31 2023 whatever the case if you need extended time away from work you should submit a leave of absence request to your employer in this article we offer several tips to help you compose a professional leave of absence request that appropriately addresses you and your employer's needs

**how to write a sick leave letter with template and example** - Sep 05 2022

web mar 6 2023 a sick leave letter is a document an employee can send to a manager or supervisor to request time off work because of an illness or injury it's important for an employee to request sick leave if they cannot perform their job duties effectively

*how to write a leave application at an office with example* - Jun 02 2022

web feb 3 2023 1 review your organization's leave policies before writing your leave application letter check your employee handbook or consult with human resources to determine what information they need to approve your request for example they may require fmla paperwork or a doctor's note for official medical leave