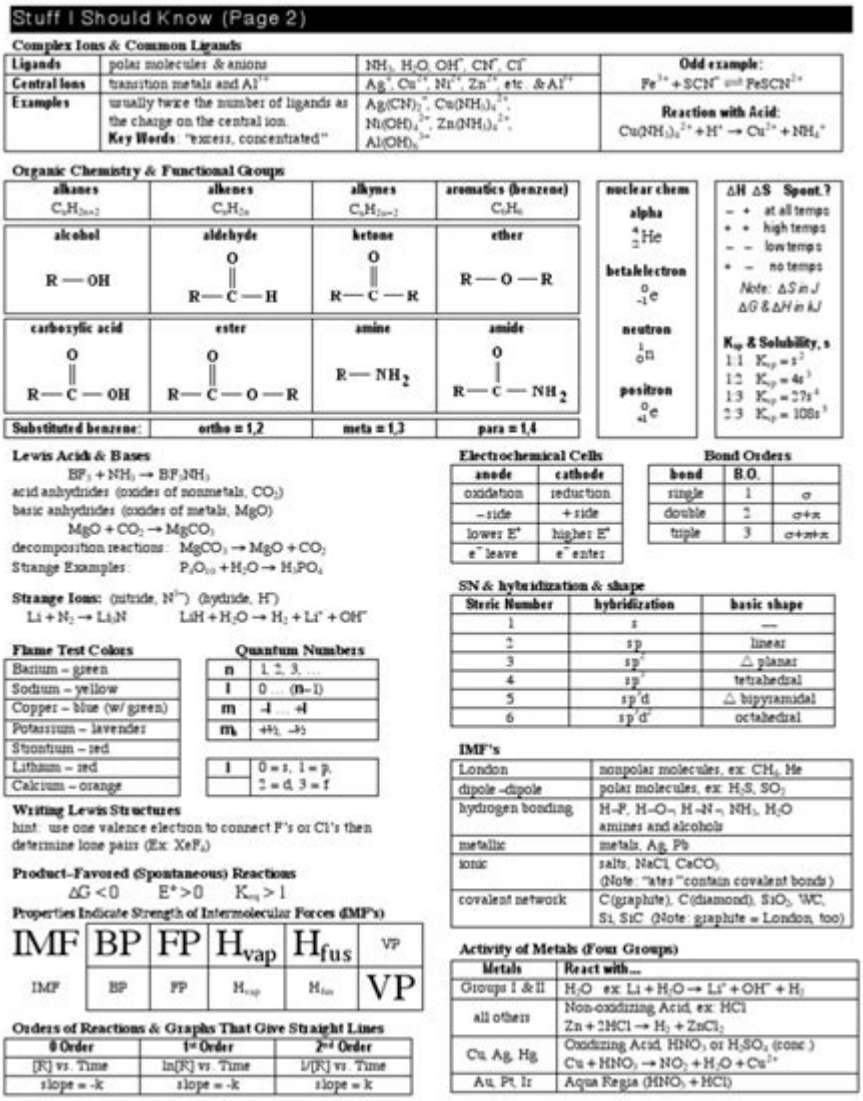
Chemistry Final Exam Cheat Sheet



Stuff I Should Know (Page 2)

Complex Ions & Common Ligands

Ligands	polar molecules & anions	NH_3, H_2O, OH^-, CN^-, Cl^-	**Odd example:** $Fe^{3+} + SCN^- \rightleftharpoons FeSCN^{2+}$
Central Ions	transition metals and Al^{3+}	Ag^+, Cu^{2+}, Ni^{2+}, Zn^{2+}, etc. & Al^{3+}	
Examples	usually twice the number of ligands as the charge on the central ion. **Key Words**: "excess, concentrated"	$Ag(CN)_2^-$, $Cu(NH_3)_4^{2+}$, $Ni(OH)_4^{2-}$, $Zn(NH_3)_4^{2+}$, $Al(OH)_6^{3-}$	**Reaction with Acid:** $Cu(NH_3)_4^{2+} + H^+ \rightarrow Cu^{2+} + NH_4^+$

Organic Chemistry & Functional Groups

alkanes	alkenes	alkynes	aromatics (benzene)
C_nH_{2n+2}	C_nH_{2n}	C_nH_{2n-2}	C_nH_n
alcohol R—OH	**aldehyde** R—C(=O)—H	**ketone** R—C(=O)—R	**ether** R—O—R
carboxylic acid R—C(=O)—OH	**ester** R—C(=O)—O—R	**amine** $R—NH_2$	**amide** R—C(=O)—NH_2
Substituted benzene:	**ortho = 1,2**	**meta = 1,3**	**para = 1,4**

nuclear chem

alpha ^4_2He

beta/electron $^0_{-1}e$

neutron ^1_0n

positron $^0_{+1}e$

ΔH ΔS Spont.?

- \+ at all temps
+ + high temps
- - low temps
+ - no temps

Note: ΔS in J
ΔG & ΔH in kJ

K_{sp} & Solubility, s

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

$BF_3 + NH_3 \rightarrow BF_3NH_3$
acid anhydrides (oxides of nonmetals, CO_2)
basic anhydrides (oxides of metals, MgO)
$MgO + CO_2 \rightarrow MgCO_3$
decomposition reactions: $MgCO_3 \rightarrow MgO + CO_2$
Strange Examples: $P_4O_{10} + H_2O \rightarrow H_3PO_4$

Strange Ions: (nitride, N^{3-}) (hydride, H^-)
$Li + N_2 \rightarrow Li_3N$ $LiH + H_2O \rightarrow H_2 + Li^+ + OH^-$

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_s	+½, -½

l	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: XeF_4)

Product-Favored (Spontaneous) Reactions
$\Delta G < 0$ $E^\circ > 0$ $K_{eq} > 1$

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	1st Order	2nd Order
[R] vs. Time	ln[R] vs. Time	1/[R] vs. Time
slope = -k	slope = -k	slope = k

Electrochemical Cells

anode	cathode
oxidation	reduction
– side	+ side
lower E°	higher E°
e^- leave	e^- enter

Bond Orders

bond	B.O.	
single	1	σ
double	2	σ+π
triple	3	σ+π+π

SN & hybridization & shape

Steric Number	hybridization	basic shape
1	s	—
2	sp	linear
3	sp^2	△ planar
4	sp^3	tetrahedral
5	sp^3d	△ bipyramidal
6	sp^3d^2	octahedral

IMF's

London	nonpolar molecules, ex: CH_4, He
dipole –dipole	polar molecules, ex: H_2S, SO_2
hydrogen bonding	H–F, H–O–, H–N–, NH_3, H_2O amines and alcohols
metallic	metals, Ag, Pb
ionic	salts, NaCl, $CaCO_3$ (Note: "ates" contain covalent bonds)
covalent network	C(graphite), C(diamond), SiO_2, WC, Si, SiC (Note: graphite = London, too)

Activity of Metals (Four Groups)

Metals	React with…
Groups I & II	H_2O ex: $Li + H_2O \rightarrow Li^+ + OH^- + H_2$
all others	Non-oxidizing Acid, ex: HCl $Zn + 2HCl \rightarrow H_2 + ZnCl_2$
Cu, Ag, Hg	Oxidizing Acid, HNO_3 or H_2SO_4 (conc.) $Cu + HNO_3 \rightarrow NO_2 + H_2O + Cu^{2+}$
Au, Pt, Ir	Aqua Regia ($HNO_3 + HCl$)

Chemistry final exam cheat sheet is an essential tool for students who are preparing for their exams. It condenses complex concepts and formulas into a manageable format, allowing you to quickly review essential information. Whether you are a high school student facing your first chemistry exam or a college student gearing up for a challenging finals week, a well-constructed cheat sheet can make all the difference in your performance.

Understanding the Importance of a Cheat Sheet

A cheat sheet serves as a quick reference guide that focuses on key topics, formulas, and concepts relevant to your chemistry course. Here are some reasons why having a chemistry final exam cheat sheet is beneficial:

- **Time Efficiency:** A cheat sheet allows you to save time by providing a concise summary of important information.

- **Enhanced Recall:** The act of creating a cheat sheet reinforces your memory and understanding of the material.
- **Focused Study:** It helps you prioritize what to study by highlighting key areas of focus.
- **Stress Reduction:** Knowing you have a reliable resource can alleviate anxiety during exam preparation.

What to Include in Your Chemistry Final Exam Cheat Sheet

Creating an effective cheat sheet involves selecting the right information. Here's a breakdown of the essential components to consider:

1. Key Formulas

Including important formulas is crucial for solving problems quickly during the exam. Here are some fundamental formulas you should include:

- **Ideal Gas Law:** $PV = nRT$
- **Concentration:** $C = n/V$
- **pH and pOH:** $pH = -\log[H^+]$, $pOH = -\log[OH^-]$
- **Calculating Molarity:** M = moles of solute/volume of solution (L)

2. Periodic Table Highlights

The periodic table is the foundation of chemistry. Include the following:

- **Commonly Used Elements:** Highlight essential elements such as H, O, N, C, Cl, and Na.
- **Trends:** Note trends such as electronegativity, ionization energy, and atomic radius.
- **Groups and Periods:** Familiarize yourself with groups like alkali metals, alkaline earth metals, halogens, and noble gases.

3. Reaction Types

Understanding different types of chemical reactions is vital for solving reaction-based problems. Consider including:

- **Synthesis Reactions:** A + B → AB

- **Decomposition Reactions:** AB → A + B
- **Single Replacement Reactions:** A + BC → AC + B
- **Double Replacement Reactions:** AB + CD → AD + CB
- **Combustion Reactions:** Hydrocarbon + O_2 → CO_2 + H_2O

Effective Study Strategies for Chemistry Finals

A cheat sheet is a great resource, but effective study strategies are equally important for success. Here are some tips to maximize your study time:

1. Start Early

Begin your study sessions well in advance of the exam to avoid cramming. Spreading out your study time will help you retain information better.

2. Organize Study Groups

Studying with peers can provide different perspectives on challenging materials. Explain concepts to each other to enhance understanding.

3. Practice Problems

Chemistry is a problem-solving subject. Regularly practice various types of problems to build confidence and familiarity.

4. Utilize Online Resources

Websites like Khan Academy, Coursera, and YouTube offer video tutorials that can help clarify complex topics.

5. Take Breaks

Incorporate regular breaks into your study schedule to avoid burnout. Techniques such as the Pomodoro Technique can be helpful.

How to Format Your Chemistry Final Exam Cheat Sheet

The format of your cheat sheet can significantly affect its usability. Here are some tips to create a clear and organized cheat sheet:

1. Use Bullet Points

Bullet points help break down complex information into digestible pieces. This format is easier to scan quickly during the exam.

2. Color Code Sections

Utilizing different colors for various sections (e.g., blue for formulas, green for definitions) can help you locate information more rapidly.

3. Keep It Concise

Limit your cheat sheet to the most vital information. Avoid overloading it with excessive details that can be overwhelming.

4. Include Diagrams

Visual aids such as diagrams, charts, and tables can enhance your understanding of complex concepts and make your cheat sheet more engaging.

Final Tips for Using Your Chemistry Final Exam Cheat Sheet

Once your cheat sheet is complete, it's essential to use it effectively:

- **Familiarize Yourself:** Review your cheat sheet multiple times to become comfortable with its layout and content.
- **Practice with It:** Use your cheat sheet while solving practice problems to simulate exam conditions.
- **Don't Rely Solely on It:** Ensure you understand the concepts rather than just memorizing information from the cheat sheet.

Conclusion

A well-prepared **chemistry final exam cheat sheet** can be a game-changer in your study routine. By condensing critical information, you enhance your ability to recall essential concepts under pressure. Coupled with effective study techniques and a proactive approach, your cheat sheet will not only serve as a useful reference but also as a powerful learning tool to boost your performance on the final exam. Remember, the goal of using a cheat sheet is not just to pass the exam but to solidify your understanding of the fascinating world of chemistry. Happy studying!

Frequently Asked Questions

What topics should be included in a chemistry final exam cheat sheet?

A chemistry final exam cheat sheet should include key concepts such as atomic structure, periodic table trends, chemical bonding, stoichiometry, thermodynamics, and basic reaction types.

How can I effectively organize my chemistry cheat sheet?

Organize your cheat sheet by categorizing topics, using bullet points for clarity, incorporating diagrams for visual aid, and highlighting essential formulas and constants.

Are there any specific formulas that should always be on a chemistry cheat sheet?

Yes, include formulas such as the ideal gas law (PV=nRT), molarity (M=mol/L), and the various equations for kinetics and equilibrium.

Is it allowed to use a cheat sheet during a chemistry final exam?

It depends on your school's policy. Some instructors allow one-page cheat sheets while others do not. Always clarify with your teacher before the exam.

What are some tips for creating an effective chemistry cheat sheet?

Focus on summarizing complex information, use color coding for different sections, include only the most important information, and practice using it while studying to ensure understanding.

Can online resources help in creating a chemistry cheat sheet?

Yes, many educational websites offer summaries, diagrams, and practice problems that can be useful in compiling information for your cheat sheet.

How can I use my chemistry cheat sheet during the exam without getting distracted?

Practice using your cheat sheet during mock exams to familiarize yourself with its layout, and try to limit your reliance on it by understanding the material as much as possible.

Chemistry Final Exam Cheat Sheet

What is Chemistry? - BYJU'S
Branches of Chemistry The five primary branches of chemistry are physical chemistry, organic chemistry, inorganic chemistry, analytical chemistry, and biochemistry. Follow the buttons ...

Main Topics in Chemistry - ThoughtCo
Aug 17, 2024 · General chemistry topics include things like atoms and molecules, how substances react, the periodic table, and the study of different compounds.

Learn Chemistry - A Guide to Basic Concepts - ThoughtCo
Jul 15, 2024 · You can teach yourself general chemistry with this step-by-step introduction to the basic concepts. Learn about elements, states of matter, and more.

Chemistry - ThoughtCo
Learn about chemical reactions, elements, and the periodic table with these resources for students and teachers.

The 5 Main Branches of Chemistry - ThoughtCo
Jul 20, 2024 · The five main branches of chemistry along with basic characteristics and fundamental explanations of each branch.

118 Elements and Their Symbols and Atomic Numbers
Feb 7, 2019 · The list of 118 Elements and their symbols and atomic numbers will prove useful to beginners in chemistry. To learn more about how elements are classified in the periodic table, …

NCERT Solutions Class 11 Chemistry Chapter 1 – Free PDF Download
NCERT Solutions for Class 11 Chemistry Chapter 1: Some Basic Concepts of Chemistry “Some Basic Concepts of Chemistry” is the first chapter in the Class 11 Chemistry syllabus as …

NCERT Solutions for Class 11 Chemistry Download Chapter-wise …
NCERT Solutions for Class 11 Chemistry Download Chapter-wise PDF for 2023-24 NCERT Solutions for Class 11 Chemistry is a study material which is developed by the faculty at …

Download Chapter-wise NCERT Solutions for Class 12 Chemistry
Download Chapter-wise NCERT Solutions for Class 12 Chemistry NCERT Solutions for Class 12 Chemistry are drafted by the faculty at BYJU’S to help students learn all the complex concepts …

Examples of Chemical Reactions in Everyday Life - ThoughtCo
May 11, 2024 · Chemistry happens in the world around you, not just in a lab. Matter interacts to form new products through a process called a chemical reaction or chemical change. Every …

What is Chemistry? - BYJU'S
Branches of Chemistry The five primary branches of chemistry are physical chemistry, organic chemistry, inorganic chemistry, analytical chemistry, and biochemistry. Follow the buttons …

Main Topics in Chemistry - ThoughtCo
Aug 17, 2024 · General chemistry topics include things like atoms and molecules, how substances react, the periodic table, and the study of different compounds.

Learn Chemistry - A Guide to Basic Concepts - ThoughtCo
Jul 15, 2024 · You can teach yourself general chemistry with this step-by-step introduction to the basic concepts. Learn about elements, states of matter, and more.

Chemistry - ThoughtCo
Learn about chemical reactions, elements, and the periodic table with these resources for students and teachers.

The 5 Main Branches of Chemistry - ThoughtCo
Jul 20, 2024 · The five main branches of chemistry along with basic characteristics and fundamental explanations of each branch.

118 Elements and Their Symbols and Atomic Numbers
Feb 7, 2019 · The list of 118 Elements and their symbols and atomic numbers will prove useful to beginners in chemistry. To learn more about how elements are classified in the periodic table, …

NCERT Solutions Class 11 Chemistry Chapter 1 – Free PDF Download
NCERT Solutions for Class 11 Chemistry Chapter 1: Some Basic Concepts of Chemistry “Some Basic Concepts of Chemistry” is the first chapter in the Class 11 Chemistry syllabus as …

NCERT Solutions for Class 11 Chemistry Download Chapter-wise …
NCERT Solutions for Class 11 Chemistry Download Chapter-wise PDF for 2023-24 NCERT Solutions for Class 11 Chemistry is a study material which is developed by the faculty at …

Download Chapter-wise NCERT Solutions for Class 12 Chemistry
Download Chapter-wise NCERT Solutions for Class 12 Chemistry NCERT Solutions for Class 12 Chemistry are drafted by the faculty at BYJU’S to help students learn all the complex concepts …

Examples of Chemical Reactions in Everyday Life - ThoughtCo
May 11, 2024 · Chemistry happens in the world around you, not just in a lab. Matter interacts to form new products through a process called a chemical reaction or chemical change. Every …

Ace your chemistry final with our ultimate chemistry final exam cheat sheet! Discover essential tips and key concepts to boost your confidence. Learn more!

Back to Home