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Reactions of Benzene

$\text{Cl}_2/\text{FeCl}_3$

$\text{Br}_2/\text{FeBr}_3$

$\text{H}_2\text{SO}_4/\text{SO}_3$

$\text{R}-\text{Cl}/\text{AlCl}_3$

$\text{R}-\text{CO}-\text{Cl}/\text{AlCl}_3$

Six reactions for electrophilic aromatic substitution

Chlorination:  $\text{Cl}_2/\text{FeCl}_3$

Bromination:  $\text{Br}_2/\text{FeBr}_3$

Nitration:  $\text{HNO}_3/\text{H}_2\text{SO}_4$

Sulfonation:  $\text{SO}_3/\text{H}_2\text{SO}_4$

Friedel-Crafts alkylation:  $\text{R}-\text{Cl}/\text{AlCl}_3$

Friedel-Crafts acylation:  $\text{R}-\text{CO}-\text{Cl}/\text{AlCl}_3$

Electrophilic aromatic substitution mechanism

Step 1: attack of the double bond at the electrophile ( $\text{E}^+$ )

Step 2: Rains proton from a carbon regains the aromaticity

This forms a carbocation. (Breaks C-C, forms C-E) (Breaks C-H and X-H)

rate determining step

Certain substituents will stabilize this carbocation. Stabilize the carbocation, speed up the reaction. Substituents that stabilize this carbocation are called activating groups.

Ortho-meta-para: What does it mean?

1,2 (ortho) 1,3 (meta) 1,4 (para)

"ortho-meta-para" only applies to disubstituted

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Question 1

1 / 1 pts

For each of the following, enter the oxidation state numerically. Make sure to enter the sign of the oxidation state (e.g. +1).

The oxidation state of H in  $\text{H}_2$  is

The oxidation state of Mn in  $\text{Mn}^{2+}$  is

The oxidation state of C in  $\text{CH}_4$  is

The oxidation state of Cl in  $\text{KClO}_4$  is

The oxidation state of S in  $\text{SO}_4^{2-}$  is

The oxidation state of C in  $\text{C}_2\text{O}_4^{2-}$  is

Answer 1: 0

Answer 2: +2

Answer 3: -4

Answer 4: +5

Answer 5: +6

Answer 6: +3

Question 2

1 / 1 pts

Which elements are oxidized and reduced in the following reaction?

$\text{HNO}_3 + \text{H}_2\text{S} + \text{H}_2\text{O} \rightarrow \text{NH}_4^+ + \text{HSO}_4^-$

sulfur is oxidized

nitrogen is reduced

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Chapter 7 Reactions, Chem 2111, Professor Dodge

1. Alkylation of Acetylenes

a. Mechanism: Deprotonation of alkyne proton, nucleophilic attack on haloalkane

b. NOTE: Only methyl and 1° haloalkanes will work in this reaction

$\text{Cyclohexyl-C}\equiv\text{CH} + \text{1) NaNH}_2, \text{2) Br-CH}_2\text{-CH}_2\text{-Cyclopentyl} \rightarrow \text{Cyclohexyl-C}\equiv\text{C-CH}_2\text{-CH}_2\text{-Cyclopentyl}$

2. Synthesis of Bromoalkenes from Alkenes

a. Mechanism: Dibromination, then dehydrohalogenation

b. Use of KOH stops reaction at bromoalkene

$\text{Cyclohexyl-CH=CH}_2 + \text{1) Br}_2, \text{2) KOH} \rightarrow \text{Cyclohexyl-CH=CH-Br}$

3. Synthesis of Alkynes from Alkenes

a. Mechanism: Dibromination, then 2 consecutive dehydrohalogenations

b. Use of  $\text{NaNH}_2$  results in alkyne formation

$\text{Cyclohexyl-CH=CH}_2 + \text{1) Br}_2, \text{2) NaNH}_2 \rightarrow \text{Cyclohexyl-C}\equiv\text{CH}$

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Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

CHAPTER 3 TEST

Atoms: The Building Blocks of Matter

MULTIPLE CHOICE On the line at the left of each statement, write the letter of the choice that best completes the statement or answers the question.

1. \_\_\_\_\_ The behavior of cathode rays in a glass tube containing gas at low pressure led scientists to conclude that the rays were composed of \_\_\_\_\_.  
a. energy c. negative particles  
b. positive particles d. neutral particles

2. \_\_\_\_\_ The basic principles of atomic theory that are still recognized today were first conceived by \_\_\_\_\_.  
a. Avogadro c. Dalton  
b. Bohr d. Rutherford

3. \_\_\_\_\_ An example of the law of multiple proportions is the existence of \_\_\_\_\_.  
a.  $\text{FeCl}_3$  and  $\text{FeSO}_4$  c. CO and  $\text{CO}_2$   
b.  $\text{O}_2$  and  $\text{O}_3$  d.  $\text{FeCl}_3$  and  $\text{Fe(NO}_3)_3$

4. \_\_\_\_\_ Atoms of the same element can differ in \_\_\_\_\_.  
a. chemical properties  
b. mass number  
c. atomic number  
d. number of protons and electrons

5. \_\_\_\_\_ Dalton's atomic theory helped to explain the law of conservation of mass because it stated that atoms \_\_\_\_\_.  
a. could not combine c. all had the same mass  
b. were invisible d. could not be created or destroyed

6. \_\_\_\_\_ Millikan's experiments determined \_\_\_\_\_.  
a. that the electron carried no charge  
b. that the electron carried the smallest possible positive charge  
c. the approximate value of the electron's mass  
d. that the electron had no mass

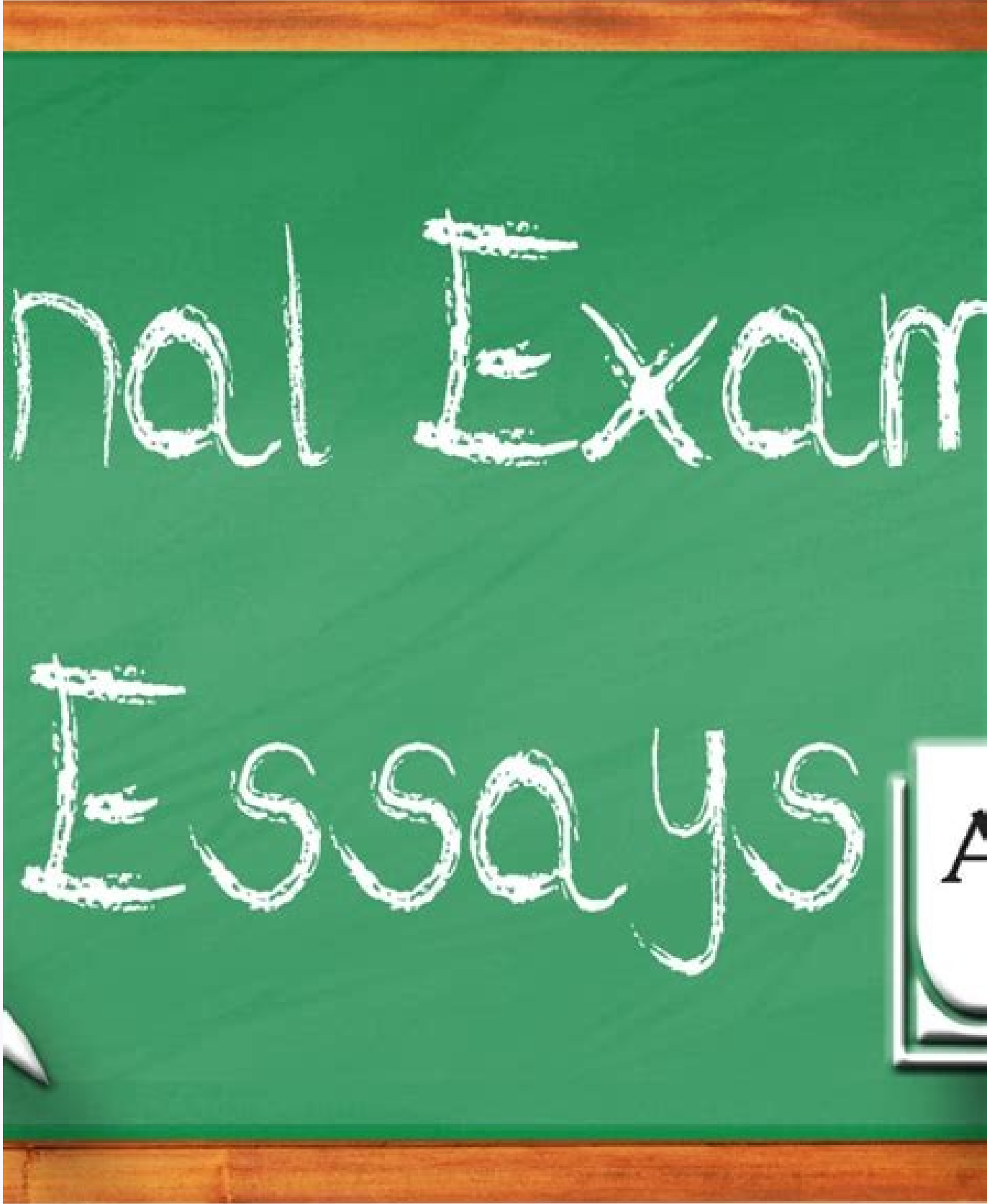
7. \_\_\_\_\_ In Rutherford's experiment, a small percentage of the positively charged particles bombarding the metal's surface \_\_\_\_\_.  
a. were slightly deflected as they passed through the metal  
b. were deflected back toward the source from the metal  
c. passed straight through the metal  
d. combined with the metal

8. \_\_\_\_\_ Most of the volume of an atom is made up of the \_\_\_\_\_.  
a. nucleus c. electron cloud  
b. nucleides d. protons

MODERN CHEMISTRY

CHAPTER 3 TEST 9

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It can be difficult to keep your notes organized throughout the academic year, especially in a class that covers so much content. This article will give you links to notes on all topics included in the Chemistry AP curriculum. If you lack some of your notes, or if you just want a more structured view than you need to know for the exam, you've come to the right place! I will also give you some study tips so you can use both these notes and the notes you have taken throughout the year for your best benefit. 2021 AP Test Changes Due to COVID-19 Due to the ongoing COVID-19 coronavirus pandemic, the AP tests will now be performed over three different sessions between May and June. The dates of your tests, and whether your tests will be online or not on paper, will depend on your school. To learn more about how all this will work and get the latest information about the test dates, online AP review, and what these changes mean to you, be sure to consult our article 2021 AP COVID-19 FAQ. How to use these AP Chemistry Notes Notes of this article can be used to study smaller parts of the curriculum or to review for the final exam of AP Chemistry. From the 2019 updates, there are nine units that organize all the concepts of the course, so I categorised these notes according to that framework. Topics should be listed approximately in the same order in which they learned them in class. These notes will provide a ton of basic information, but keep in mind that AP Chemistry is less about memorizing facts and more about the ability to apply your knowledge to a variety of experimental scenarios. The reading of notes can only take you to the moment. Practice problems are essential (a point that I will again emphasize further in this article). Take a diagnostic test before you dive into these notes if you plan to use them to review for the full AP test. Based on yourcan s e e which areas need further improvement, and then can focus on the most relevant notes. AP AP Notes These notes come from various sources. Some of them are deepened, others give a broad general view. Some focus more on notes, others © work through practice issues. The goal is © give you a comprehensive guide to what you need to know for The Ap Mica. Note that because AP Chemistry's resumes were recently updated in 2019, some online notes have not yet been updated, and © why some typical scans don't have matching notes and some notes cover several typical notes. In the end, I© also include a link to a document created by an AP Quantum Teacher of Music© Teaching that goes through all the concepts in one place. Unit 1: Atomic Structure and Properties Unit 2: Unit of Structure and Properties of Molecular and IÁnico Compound 3: Unit of Forts and Intermolecular Properties 4: Unit of Quantum ResTions 5: Kinetics© Looking for help to study for your AP exams? Our one-on-one online AP tutoring services can help you prepare for your AP exams. Combine with a top tutor who has earned a high score on the exam for which you are studying! Unit 6: Thermodynamic Unit 7: EquilÁbrio Unit 8: Unit of Ácidos and Bases 9: Applications of Thermodynamic The Happiness of Knowledge. In addition © addition, this type should arrive immediately. This is © what happens when you attract, folks. Study Strategies© for AP Quantum Notes If you want to use these notes to your full advantage, you should not just go to them all and consider yourself prepared. For the comic, you need to dig deeper to fully understand the material. Here are some tips to keep in mind: Tip 1: Start at the beginning If you are studying for the comic, you should work© your way through concepts in the order of when they appear in the curriculum. You need to master the first night, or more advanced problems will look complete gibberish for you. If there are any in Unit 1 that you do not feel comfortable with, start your study with these. Everything else in the course is based on the concepts you learned in the first few months! Hint 2: 2: Tracking with practice problems Every time you read a set of notes, make some problems of practice to be sure to have absorbed the information. Reading these notes is © a waste of time if they do not provide you with the basic information and the necessary skills to solve relevant problems. If you find that you are having problems with practice after you have read the notes, this should be a red flag you need© to modify your study strategy. Tip 3: Supplement with other resources Don't forget the notes you took in class, the brochures your teacher gave you, and any other resources you've accumulated throughout the year. It's worth shopping and see if certain explanations of concepts resound more than others. You may decide that the videos that explain concepts are more important to you than notes, or you can choose to buy a review book that provides more guidance in the planning of your studies. Tip 4: Don't shrink! It's foolish to cump to Comic AP. You need to do a lot of serious problems to feel comfortable with the material, and if it fills up, you won't be able to spend enough time on it. Don't withdraw your grades in the exam © and expect to learn everything in a marathon study section. You won't retain the information, and you'll be exhausted for testing. The crushing is © very similar to trying to retain a huge volume of water with a really fragile dam. It won't work well. Conclusion The notes in this article should help you review all the essential concepts you need to know for the AP Mica exam. Make sure you complement your review with practice tests so you can assess your progress and see where your main strengths and weaknesses lie. Also© keep in mind the tips I went through in the last section: Start at the beginning of the course Follow your studies with practical problems Supply these notes with other resources Avoid filling this article so that query the notes wheneverTo review specific concepts and / or start your cumulative revision of year-end! What follows? Need notes for additional AP classes for all of chemical? See our articles with notes for Psychology AP, AP Biology, and History AP US. The notes are all good and good, but when it is that you really need to start using them to review for the test? Find out how they should start early to study for exams after if your goal is to get a great score. Have you planned your schedule for the rest of your time in secondary school? Case contrary, this guide will help you decide which classes to have to have in the future! One of the most important parts of your candidacy is the classes you choose to do at the lyceum (in conjunction with what well comes out in these classes). Our team of experts in paramilar admissions has compiled their knowledge in this unique guide to plan their secondary education courses program. We will advise you on how to balance your agenda between regular and honor / AP / IB courses, such as choosing your extracurricular courses, and which lessons can not afford to do not attend.

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