

Answer Questions 1-26 on your scantron. Only one answer for each question (2 pt ea). Some have instructions to mark your scantron with more than one answer.

CHP 5.1 (Reaction Thermodynamics)

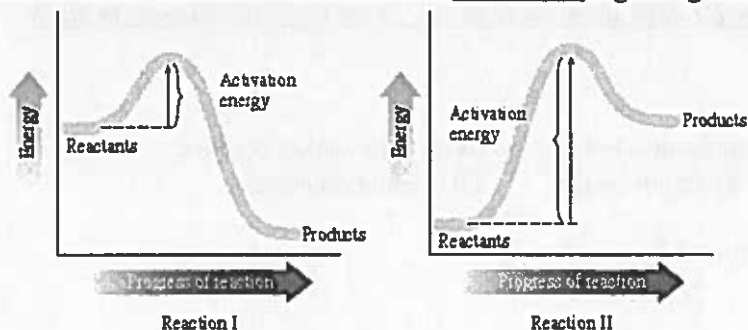
- The minimum energy that reactants need in order for the molecules to be in the correct orientation is called:
 A) collision energy B) dissociation energy C) activation energy D) orientation energy
- For a reaction to be exothermic or endothermic it is determined by:
 A) collision orientation of molecules
 B) the states of the reactants
 C) the activation energy
 D) the overall loss or gain of energy when the bonds break and reform

(18 pt) Calculate the Calories in the nut from the following data obtained from the calorimetry experiment done in lab.

Mass of empty soft drink can (g)	32.543 g	
Mass of can + water (g)	135.529 g	
(2 pt) Mass of water (g) <i>Show calculation.</i>		
Initial temperature water (°C)	20.1 °C	
Final temperature water (°C)	79.2 °C	
(2 pt) Temperature change of water (°C) <i>Show calculation.</i>		
Mass of the nut (g)	1.481 g	
Mass of the residue after nut is burned (g)	0.134 g	
Mass of nut consumed by combustion (g) <i>Show calculation</i>		
Specific heat of water	1.00 calorie/g °C	
(6 pt) Energy absorbed by water (cal) <i>Show calculation.</i>		
(2 pt) Energy released by the nut (cal)		
(2 pt) Energy released by the nut (Cal) <i>Show calculation.</i>		
(4 pt) Cal/g of nut consumed <i>Show calculation</i>		

CHP 5.2 (Reaction Rates)

3. Determine which of the statements is CORRECT regarding this figure:

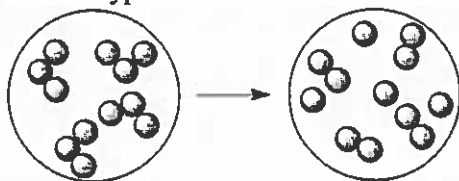


- A) Reaction I occurs faster than reaction II.
 B) Reaction II occurs faster than reaction I.
 C) Reaction I is endergonic.
 D) Reaction II is exergonic.
 E) The activation energy for reaction I is larger than that of reaction II.
4. Which of the following processes is nonspontaneous?
 A) An antacid tablet reacting with stomach acid to produce carbon dioxide
 B) A hot pan cooling on the counter
 C) Water turning to ice below 0°C
 D) A battery being recharged
5. Which of the following actions would not increase the rate of a reaction?
 A) Diluting the reactants by a factor of 2
 B) Increasing the temperature by 10°C
 C) Adding a catalyst
 D) Increasing the concentration of the reactants by a factor of 2

CHP 5.3 (Types of Chemical Reactions)

(8 pt) Write the balanced equation for the combustion of octane.

6. What type of reaction is illustrated in this diagram?



- A) combination B) decomposition C) single displacement D) double displacement
7. A piece of zinc placed in hydrochloric acid results in a fierce effervescence and the zinc eventually dissolves, yielding a solution of zinc chloride. A glowing splint gives a "popping" sound, indicating the presence of hydrogen gas. What type of reaction is it?
 A) combination B) decomposition C) single displacement D) double displacement

CHP 5.4 (Oxidation and Reduction)

8. When a substance is oxidized it is called a(n):

- A) oxidizing agent B) reducing agent C) both D) neither

9. When an organic molecule loses hydrogens it is said to be:

- A) reduced B) oxidized C) both oxidized and reduced D) neither oxidized or reduced

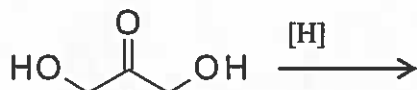
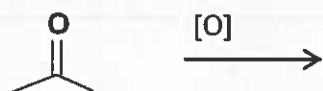
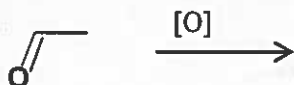
10. If this is the oxidized form of NAD⁺ which of the following is the reduced form of this important biomolecule?

- A) NADH₂ B) NADH C) NAD D) NAD⁻

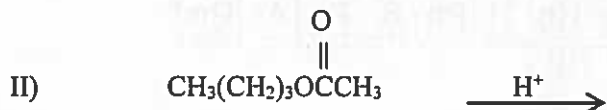
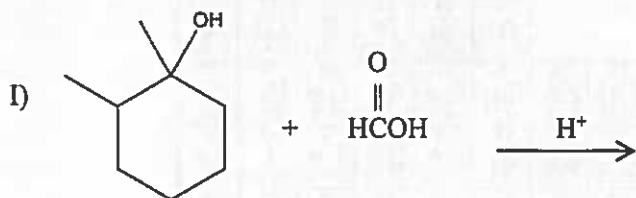
11. In the Benedict's test for monosaccharides the aldehyde functional group of the sugar is converted to a carboxylic acid group (*Mark two answers, one for the oxidized substance and one for the reduced substance.*):

- A) The sugar is reduced
 B) The sugar is oxidized.
 C) The copper (II) ion is reduced and forms a brick red Cu₂O precipitate.
 D) The copper (II) ion is oxidized and forms a brick red Cu₂O precipitate

(6 pt) Complete each of the following oxidation/reduction reactions. Write NR if there is no reaction.

CHP 5.5 (Condensation Reactions)

Complete each of the following reactions (4 pt ea)

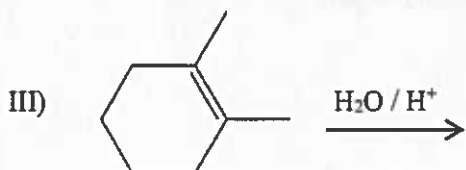
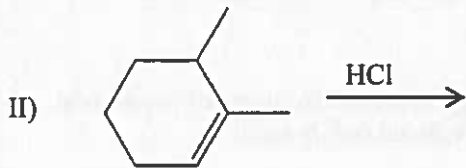
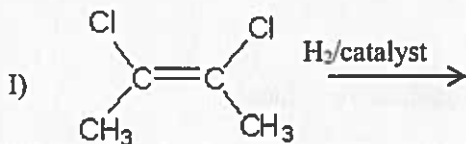


12. Reaction _____ above is a condensation reaction.

- A) I B) II C) no reaction is a condensation reaction.

CHP 5.6 (Addition Reactions)

Complete the following addition reactions (2 pt ea).



15. Reaction _____ above is a hydration reaction.

B) I B) II C) III D) no reaction is a hydration reaction.

8 pt

PERIODIC CHART OF THE ELEMENTS

1 H 1.00794																	1 H 1.00794	2 He 4.00260
3 Li 6.939	4 Be 9.0122											5 B 10.811	6 C 12.0112	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.183	
11 Na 22.9898	12 Mg 24.372											13 Al 26.9815	14 Si 28.086	15 P 30.9738	16 S 32.064	17 Cl 35.453	18 Ar 39.948	
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.88	23 V 50.942	24 Cr 51.996	25 Mn 54.938	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.9216	34 Se 78.96	35 Br 79.909	36 Kr 83.80	
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc (99)	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40	49 In 114.82	50 Sn 118.59	51 Sb 121.75	52 Te 127.60	53 I 126.904	54 Xe 131.30	
55 Cs 132.905	56 Ba 137.34	*57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.980	84 Po (210)	85 At (210)	86 Rn (222)	
87 Fr (223)	88 Ra (226)	†89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (262)	108 Hs (265)	109 Mt (266)	110 ? (271)	111 ? (272)	112 ? (277)							

* Lanthanide Series

58 Ce 140.12	59 Pr 140.907	60 Nd 144.24	61 Pm (147)	62 Sm 150.35	63 Eu 151.96	64 Gd 157.25	65 Tb 158.924	66 Dy 162.50	67 Ho 164.930	68 Er 167.26	69 Tm 168.934	70 Yb 173.04	71 Lu 174.97
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† Actinide Series

90 Th 232.038	91 Pa (231)	92 U 238.03	93 Np (237)	94 Pu (242)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (249)	99 Es (254)	100 Fm (253)	101 Md (256)	102 No (256)	103 Lr (257)
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