

Chem Final Spring 2017

Multiple Choice

Identify the choice that best completes the statement or answers the question.

Periodic Table of the Elements

Chemistry Reference Sheet

California Standards Test

																18		
1	1A													2	8A			
1	H Hydrogen 1.01	2	He Helium 4.00															
2	3 Li Lithium 6.94	4 Be Beryllium 9.01	5A	6 B Boron 10.81	7 C Carbon 12.01	8 N Nitrogen 14.01	9 O Oxygen 16.00	10 F Fluorine 19.00	11 Ne Neon 20.18									
3	11 Na Sodium 22.99	12 Mg Magnesium 24.31	13 Al Aluminum 26.98	14 Si Silicon 28.09	15 P Phosphorus 30.97	16 S Sulfur 32.07	17 Cl Chlorine 35.45	18 Ar Argon 39.95										
4	19 K Potassium 39.10	20 Ca Calcium 40.08	21 Sc Scandium 44.96	22 Ti Titanium 47.87	23 V Vanadium 50.94	24 Cr Chromium 52.00	25 Mn Manganese 54.94	26 Fe Iron 55.85	27 Co Cobalt 58.93	28 Ni Nickel 58.69	29 Cu Copper 63.55	30 Zn Zinc 65.39	31 Ga Gallium 69.72	32 Ge Germanium 72.61	33 As Arsenic 74.92	34 Se Selenium 78.96	35 Br Bromine 79.90	36 Kr Krypton 83.80
5	37 Rb Rubidium 85.47	38 Sr Strontium 87.62	39 Y Yttrium 88.91	40 Zr Zirconium 91.22	41 Nb Niobium 92.91	42 Mo Molybdenum 95.94	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.42	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.60	53 I Iodine 126.90	54 Xe Xenon 131.29
6	55 Cs Cesium 132.91	56 Ba Barium 137.33	57 La Lanthanum 138.91	58 Ce Cerium 140.12	59 Pr Praseodymium 140.91	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.93	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.97	
7	87 Fr Francium (223)	88 Ra Radium (226)	89 Ac Actinium (227)	90 Th Thorium 232.04	91 Pa Protactinium 231.04	92 U Uranium 238.03	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (262)	

Key

11	Na	Atomic number
—	—	Element symbol
—	Sodium	Element name
22.99		Average atomic mass*

* If this number is in parentheses, then it refers to the atomic mass of the most stable isotope.

Periodic Table of the Electronegativities

1 H 2.1												6 — Atomic Number C — Symbol 2.5 — Electronegativity							Group 18 2 He
Group 1	Group 2											Group 13	Group 14	Group 15	Group 16	Group 17			
3 Li 1.0	4 Be 1.5											5 B 2.0	6 C 2.5	7 N 3.0	8 O 3.5	9 F 4.0	10 Ne		
11 Na 0.9	12 Mg 1.2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12	13 Al 1.5	14 Si 1.8	15 P 2.1	16 S 2.5	17 Cl 3.0	18 Ar		
19 K 0.8	20 Ca 1.0	21 Sc 1.3	22 Ti 1.5	23 V 1.6	24 Cr 1.6	25 Mn 1.5	26 Fe 1.8	27 Co 1.8	28 Ni 1.8	29 Cu 1.9	30 Zn 1.6	31 Ga 1.6	32 Ge 1.8	33 As 2.0	34 Se 2.4	35 Br 2.8	36 Kr 3.0		
37 Rb 0.8	38 Sr 1.0	39 Y 1.2	40 Zr 1.4	41 Nb 1.6	42 Mo 1.8	43 Tc 1.9	44 Ru 2.2	45 Rh 2.2	46 Pd 2.2	47 Ag 1.9	48 Cd 1.7	49 In 1.7	50 Sn 1.8	51 Sb 1.9	52 Te 2.1	53 I 2.5	54 Xe 2.6		
55 Cs 0.7	56 Ba 0.9	57 La 1.1	72 Hf 1.3	73 Ta 1.5	74 W 1.7	75 Re 1.9	76 Os 2.2	77 Ir 2.2	78 Pt 2.2	79 Au 2.4	80 Hg 1.9	81 Tl 1.8	82 Pb 1.8	83 Bi 1.9	84 Po 2.0	85 At 2.2	86 Rn 2.4		
87 Fr 0.7	88 Ra 0.9	89 Ac 1.1	104 Unq	105 Unp	106 Unh	107 Uns	108 Uno	109 Uue											

Lanthanide Series

58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2
90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr
1.3	1.5	1.7	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3

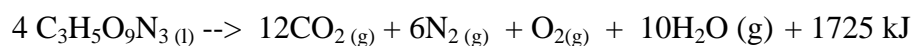
Actinide Series

Name: _____

ID: A

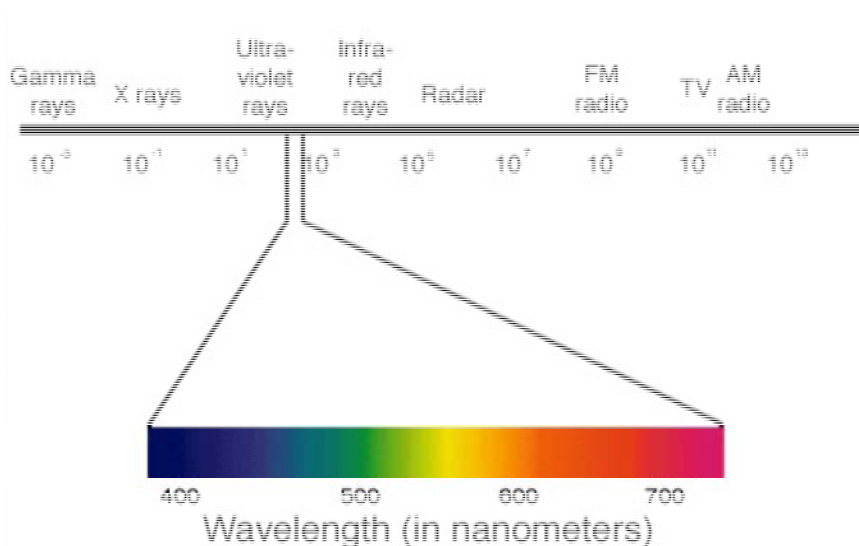
(-1) Charge Formula	(-1) Charge Names	(-2) Charge Formula	(-2) Charge Names
H_2PO_4^-	Dihydrogen phosphate	HPO_4^{2-}	Hydrogen phosphate
HSO_3^-	Hydrogen Sulfite	$\text{Cr}_2\text{O}_7^{2-}$	Dichromate
HSO_4^-	Hydrogen Sulfate	O_2^{2-}	Peroxide
HCO_3^-	Hydrogen Carbonate		
MnO_4^-	Permanganate		
ClO^-	Hypochlorite		
ClO_2^-	Chlorite		

- _____ 1. Which of these is an example of an exothermic chemical process?
- a. photosynthesis of glucose c. evaporation of water
b. combustion of gasoline d. melting ice
- _____ 2. The temperature of a substance is 23 degrees Celsius. Convert these degrees to Kelvin.
- a. -250K c. 300K
b. 296K d. 273K
- _____ 3. The following equation shows the reaction that occurs when nitroglycerine explodes.

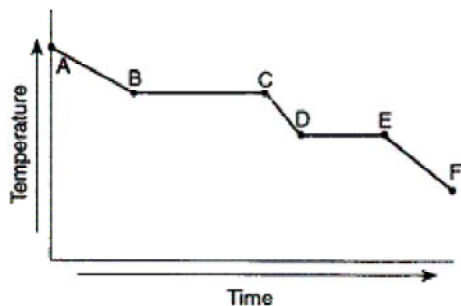


How many **Joules** of energy are released in an explosion of nitroglycerine?

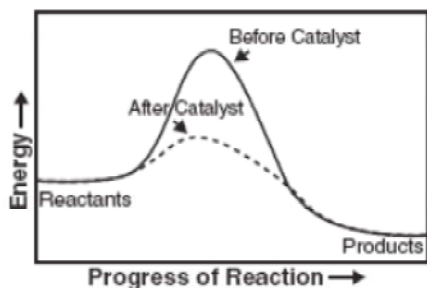
- a. 1725 c. 1.725
b. 1.725×10^6 d. 1.725×10^3



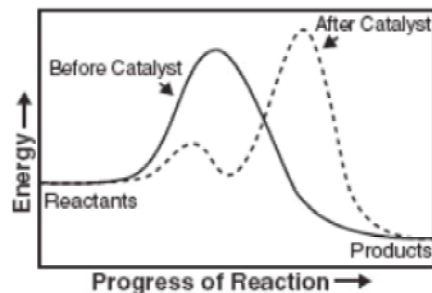
4. Radio and radar waves are examples of
- low frequency and short wavelengths
 - low frequency and long wavelength
 - high frequency and long wavelengths
 - high frequency and short wavelengths
5. What is the percent composition of chromium in chromium (III) oxalate?
- 28.3%
 - 17.2%
 - 26.3%
 - 14.1%
6. In which of the following is the number of neutrons correctly represented?
- ${}_{92}^{238}\text{U}$ has 146 neutrons
 - ${}_{9}^{19}\text{F}$ has 0 neutrons
 - ${}_{12}^{24}\text{Mg}$ has 24 neutrons
 - ${}_{79}^{197}\text{Au}$ has 79 neutrons
 - ${}_{33}^{75}\text{As}$ has 108 neutrons
7. Which of the following represents a Brønsted-Lowry conjugate acid-base pair?
- H_3O and H_2
 - SO_3^{2-} and SO_2
 - NH_4^+ and NH_3
 - CO_3^{2-} and CO
8. What is the correct name for this compound: HNO_3 ?
- Hydronitrous Acid
 - Hydronitric Acid
 - Nitrous Acid
 - Nitric Acid
9. A 25.0 g sample of water at 100°C has an energy change of -1670 J . What is the new temperature of the water?
- 58.5°C
 - 84.0°C
 - 104.18°C
 - 116°C



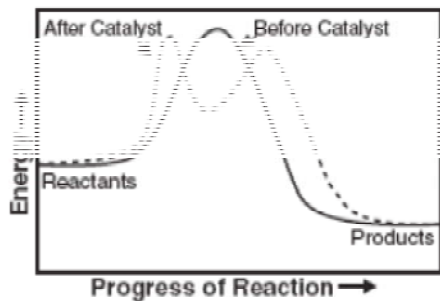
- ___ 10. According to the above figure, what is happening as a substance goes from point A to point B?
- | | |
|------------------------------|----------------------------|
| a. A gas is condensing | c. Ice is melting |
| b. A solid is getting warmer | d. A gas is getting colder |
- ___ 11. Which element would have the highest ionization energy?
- | | |
|-------|------|
| a. F | d. C |
| b. O | e. B |
| c. Li | |
- ___ 12. Which diagram shows the appropriate effect of using a catalyst in a chemical reaction?



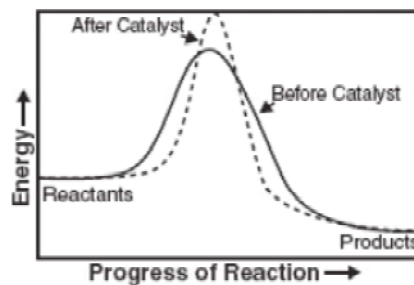
a.



c.



b.



d.

- ___ 13. Express the sum of 7.68 m and 5.0 m using the correct number of significant digits.
- | | |
|-----------|------------|
| a. 10 m | c. 13 m |
| b. 12.7 m | d. 12.68 m |

Model 2 – Results of Alka-Seltzer® Experiment

	Number of Alka-Seltzer Tablets	Volume of Vinegar (mL)	Room Pressure (kPa)	Initial Temp (°C) (Vinegar Solution)	Final Temp. (°C) (Final Mixture)
Trial 1	1	100.0	84	23.5	22.6
Trial 2	2	100.0	84	23.5	21.5
Trial 3	3	100.0	84	23.5	20.4
Trial 4	4	100.0	84	23.5	19.2
Trial 5	5	100.0	84	23.5	18.1

- _____ 14. Choose the best claim for this experiment.
- If I increase the number of alka-seltzer then tablets the temperature increases.
 - If we increase the number of alka-seltzer tablets then the temperature decreases.
 - If I change the number of tablets then the temperature also changes.
- _____ 15. Interpret the equation below in terms of representative particles.
- $$\text{N}_2(\text{g}) + 3\text{F}_2(\text{g}) \rightarrow 2\text{NF}_3(\text{g})$$
- 1 molecule of nitrogen + 3 molecules of fluorine to produce 2 molecules of nitrogen trifluoride
 - 1 atom of nitrogen + 6 atoms of fluorine to produce 2 molecules of nitrogen trifluoride
 - 1 atom of nitrogen + 3 molecules of fluorine to produce 2 formula units of nitrogen trifluoride
 - 1 atom of nitrogen + 3 atoms of fluorine to produce 2 molecules of nitrogen trifluoride
- _____ 16. What is the correct product when an Aluminum Ion and a Chloride ion form an ionic compound?
- Al_3Cl_1
 - AlCl_3
 - AlCl
 - Al3Cl
- _____ 17. What is the correct noble gas electron configuration for a **Chloride ion**?
- $[\text{Ne}]3s^23p^6$
 - $[\text{Ar}]3s^23p^5$
 - $[\text{Ar}]3s^23p^6$
 - $[\text{Ne}]3s^23p^5$
- _____ 18. How do the isotopes hydrogen-1 and hydrogen-2 differ?
- Hydrogen-1 has no protons; Hydrogen-2 has one.
 - Hydrogen-1 has one neutron; Hydrogen-2 has two protons..
 - Hydrogen-1 has one protons; Hydrogen-2 has two.
 - Hydrogen-1 has one protons; Hydrogen-2 has one protone and one neutron.
- _____ 19. The reaction below has a 96.8% yield. how many actual grams of CaSO_4 are recovered when 5.24g of SO_2 react with CaCO_3 and O_2 ?
- $$2\text{CaCO}_3 + 2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{CaSO}_4 + 2\text{CO}_2$$
- 11.13 g CaSO_4
 - 10.7g CaSO_4
 - 9.36 g CaSO_4
 - 10.00 g CaSO_4
- _____ 20. Which compound represents a molecular compound?
- NaNO_3
 - HBr
 - KF
 - S_2Br_6
- _____ 21. What is the correct formula for potassium sulfite?
- K_2SO_3
 - KHSO_3
 - KHSO_4
 - K_2SO_4



What volume of C_8H_{18} will completely react to produce exactly 36 liters of H_2O ?



- a. 36 L
b. 2.0 L
c. 27 L
d. 4 L

___ 23. How many mL of a 2.0M NaBr solution are needed to make 200.0 mL of 0.50M NaBr?

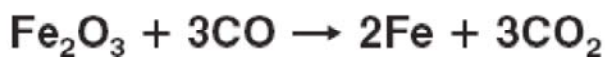
- a. 50 mL
b. 100 mL
c. 150 mL
d. 25 mL

___ 24. In an equilibrium reaction with a K_{eq} of 1×10^2 , the ____.

- a. the products are favored
b. reaction is exothermic
c. reaction is spontaneous
d. reactants are favored

___ 25. What is the correct name for the compound CoCl_2 ?

- a. cobalt(I) chlorate
b. cobalt(I) chloride
c. cobalt(II) chlorate
d. cobalt(II) chloride



___ 26. In this reaction, how many grams of Fe_2O_3 are required to completely react with 84 grams of CO?



- a. 80
b. 1400
c. 64
d. 160

___ 27. Phosphoric acid will make what conjugate base?

- a. H_2PO_3^-
b. HPO_4^{2-}
c. H_3PO_4
d. H_2PO_4^-

___ 28. Calculate the percent of oxygen in aluminum sulfate.

- a. There is no oxygen in aluminum sulfate.
b. 46% Oxygen
c. 52% Oxygen
d. 69% Oxygen
e. 56% Oxygen

___ 29. The equilibrium constant expression for the reaction: $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$ is

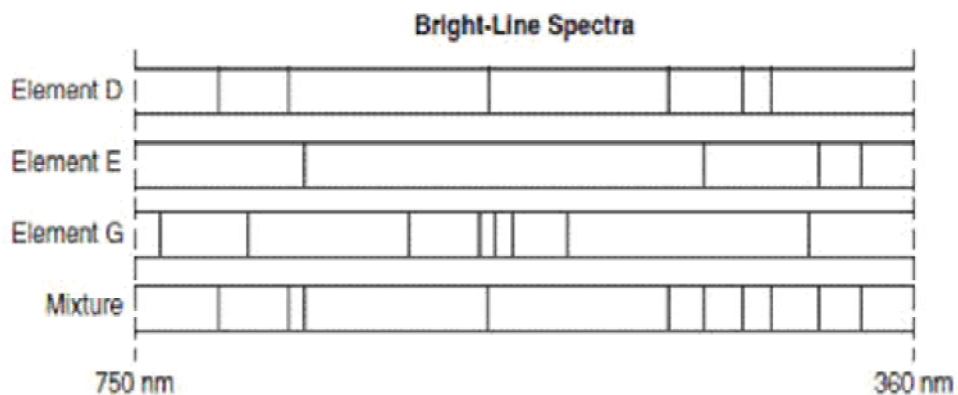
- a. $K_{\text{eq}} = [\text{N}_2][\text{O}_2]/[\text{NO}]^2$
b. $K_{\text{eq}} = [\text{NO}]^2/[\text{N}_2][\text{O}_2]$
c. $K_{\text{eq}} = 2[\text{NO}]/[\text{N}_2][\text{O}_2]$
d. $K_{\text{eq}} = [\text{N}_2][\text{O}_2]/2[\text{NO}]$

___ 30. Which of the following is a monatomic gas at STP?

- a. Chlorine
b. Fluorine
c. Nitrogen
d. Helium

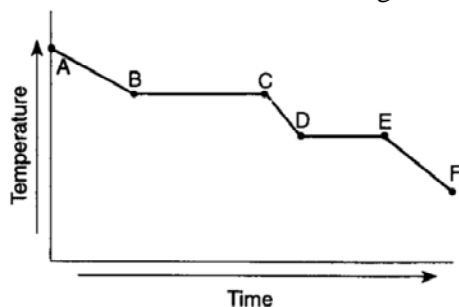
____ 31.

Given the bright-line spectra of three elements and the spectrum of a mixture formed from at least two of these elements:



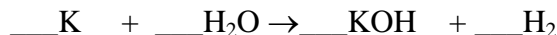
Which elements are present in this mixture?

- a. D and G
 b. D, E, and G
 c. D and E
 d. E and G
- ____ 32. Which of these solutions is the most basic?
- a. $[H^+] = 1 \times 10^{-11} M$
 b. $[H^+] = 1 \times 10^{-2} M$
 c. $[OH^-] = 1 \times 10^{-13} M$
 d. $[OH^-] = 1 \times 10^{-4} M$
- ____ 33. A cup of gold colored metal beads was measured to have a mass 425 grams. By water displacement, the volume of the beads was calculated to be 48.0 mL. Given the following densities, identify the metal.
Gold: 19.3 g/mL
Copper: 8.85 g/mL
Bronze: 9.87 g/mL
- a. Bronze
 b. Copper
 c. Gold
- ____ 34. Choose the correct formula for region DE.

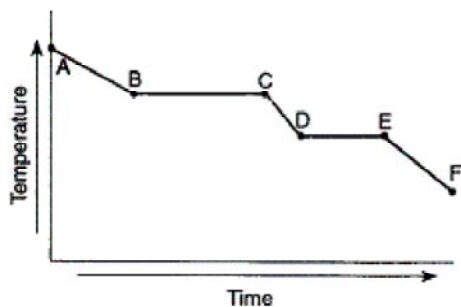


- a. $Q = m\Delta H_{fus}$
 b. $Q = mC\Delta T$
 c. $Q = m\Delta H_{vap}$
 d. $Q = m-\Delta H_{fus}$
 e. $Q = m-\Delta H_{vap}$

- ___ 35. An over the counter medicine has 325 mg of its active ingredient per tablet. How many grams does this mass represent?
- a. 325,000 g
 - b. 0.325 g
 - c. 32.5 g
 - d. 3.25 g
- ___ 36. Which group of elements will have the strongest attraction for electrons?
- a. Alkali Metals
 - b. Transition Metals
 - c. Halogens
 - d. Noble Gases
- ___ 37. What is the correct electron configuration for Gold?
- a. $[\text{Rn}]6s^24f^{14}5d^9$
 - b. $[\text{Rn}]6s^25d^9$
 - c. $[\text{Xe}]6s^25d^9$
 - d. $[\text{Xe}]6s^24f^{14}5d^9$
- ___ 38. How much heat needs to be absorbed by 100.0 g of water at 5.0°C to raise its temperature to 75.0°C ?
- a. 4.18 J
 - b. 2.93×10^4 J
 - c. 175 J
 - d. 1.57×10^5 J
- ___ 39. Standard temperature and pressure (STP) are defined as
- a. 0°C and 1-kPa
 - b. 0°C and 1-atm
 - c. 0-K and 1-atm
 - d. 0-K and 1-kPa
- ___ 40. Which of the following elements will require the most energy to remove an electron from its outer energy level?
- a. Neon
 - b. Cesium
 - c. Lanthanum
 - d. Chlorine
- ___ 41. Which expression proves the law of conservation of mass for the following equation. Balance the equation first.



- a. 114.2 g of reactants = 114.2 g of products
- b. 57.1 g of reactants = 57.1 g of products
- c. 57.1 g of reactants = 58.1 g of reactants
- d. 164.2 g of reactants = 82.1 g of products



- ___ 42. According to the above figure, choose the best description?
- a. ΔT and Endothermic
 - b. ΔT and Exothermic
 - c. ΔT Neither Exothermic or Endothermic
 - d. $-\Delta T$ and Exothermic
 - e. $-\Delta T$ and Endothermic
- ___ 43. Classify ammonium chloride.
- a. formula unit
 - b. molecule
 - c. atom

- ___ 44. What type of representative particle is C_2H_5OH ?
- a. molecule
 - b. formula unit
 - c. atom

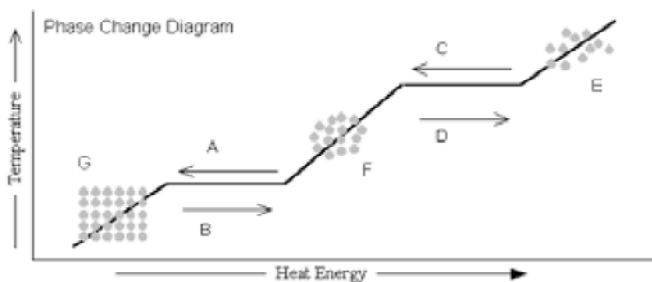


A mass of 5.4 grams of aluminum (Al) reacts with an excess of copper (II) chloride ($CuCl_2$) in solution, as shown above. What mass of solid copper (Cu) is produced?

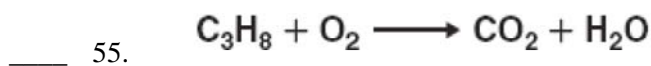


- a. 8.5 grams
 - b. 19 grams
 - c. 28 grams
 - d. 38 grams
- ___ 46. What must happen for liquid water to freeze?
- a. The water molecules must begin to move faster
 - b. The water molecules must begin to move in random patterns.
 - c. The water must absorb kinetic energy from the surroundings.
 - d. The water must release energy to the surroundings.
- ___ 47. Iron has a density of 7.86 g/cm^3 . The volume occupied by 55.85 g of iron is
- a. 439 cm^3
 - b. 7.11 cm^3
 - c. 2.8 cm^3
 - d. 0.141 cm^3
- ___ 48. How many protons and electrons are in a **Calcium ion**?
- a. 20, 20
 - b. 20, 18
 - c. 18, 20
 - d. 18, 18
- ___ 49. What is the molarity of 200 mL of solution in which 2.0 moles of sodium bromide is dissolved?
- a. $0.40M$
 - b. $4.0M$
 - c. $2.0M$
 - d. $10M$
- ___ 50. Select the set of coefficients that properly balance the equation below.
- $$\text{___ } Fe_2O_3 \rightarrow \text{___ } Fe + \text{___ } O_2$$
- a. 2, 4, 3
 - b. 3, 4, 4
 - c. 1, 2, 3
 - d. 2, 2, 3
- ___ 51. What happens to the solubility of a gas, in a liquid, if the partial pressure of the gas above the liquid decreases?
- a. The solubility decreases.
 - b. The solubility increases.
 - c. The solubility remains the same.
 - d. The solubility cannot be determined.
- ___ 52. How many atoms are in a chromium sample with a mass of 13 grams ?
- a. 1.5×10^{23}
 - b. 2.4×10^{24}
 - c. 1.9×10^{26}
 - d. 3.3×10^{23}
- ___ 53. Which statement *best* describes the density of an atom's nucleus?
- a. The nucleus occupies most of the atom's volume but contains little of its mass.
 - b. The nucleus occupies very little of the atom's volume and contains little of its mass.
 - c. The nucleus occupies very little of the atom's volume but contains most of its mass.
 - d. The nucleus occupies most of the atom's volume and contains most of its mass.

54. Choose the correct formula to find the amount of heat change at B.



- a. $Q = m \cdot \Delta H_{\text{vap}}$
 b. $Q = m \Delta H_{\text{vap}}$
 c. $Q = m \Delta H_{\text{fus}}$
 d. $Q = m C \Delta T$
 e. $Q = m \cdot \Delta H_{\text{fus}}$



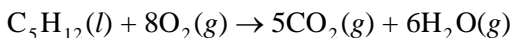
This chemical equation represents the combustion of propane. When correctly balanced, the coefficient for water is

- a. 4
 b. 8
 c. 16
 d. 2

56. What is the density of 1 mole of NO_2 gas at STP?

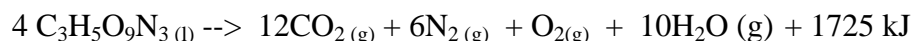
- a. 2.05 g/L
 b. 0.513 g/L
 c. 1.03 g/L
 d. 1.34 g/L

57. Which of the following is true about the total number of reactants and the total number of products in the reaction shown below?



- a. 9 atoms of reactants chemically change into 11 atoms of product.
 b. 9 liters of reactants chemically change into 11 liters of product.
 c. 9 moles of reactants chemically change into 11 moles of product.
 d. 9 grams of reactants chemically change into 11 grams of product.

58. The following equation shows the reaction that occurs when nitroglycerine explodes.



Classify this reaction.

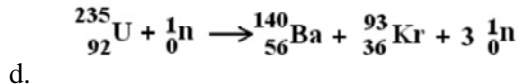
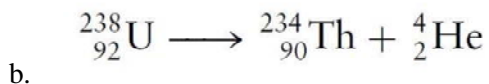
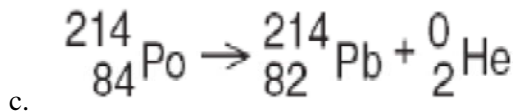
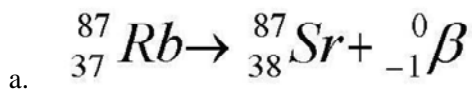
- a. Combustion
 b. Decomposition
 c. Double Replacement
 d. Combination

59. Lead nitrate can be decomposed by heating. What is the percent yield of the decomposition reaction if 9.9 g $\text{Pb}(\text{NO}_3)_2$ are heated to give 5.5 g of PbO ?



- a. 67%
 b. 56%
 c. 44%
 d. 82%

- ___ 60. Which of the following ions should have the largest ionic radius?
 a. Oxide ion
 b. Selenide ion
 c. Potassium Ion
 d. Bromide ion
- ___ 61. Which equation correctly represents the alpha decay of an isotope?



___ 62.

pH Levels

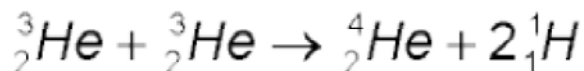
$[\text{H}_3\text{O}^+]$	pH	Example
1×10^0	0	HCl (4%)
1×10^{-1}	1	Stomach acid
1×10^{-2}	2	Lemon juice
1×10^{-3}	3	Vinegar
1×10^{-4}	4	Soda
1×10^{-5}	5	Rainwater
1×10^{-6}	6	Milk
1×10^{-7}	7	Pure water
1×10^{-8}	8	Egg whites
1×10^{-9}	9	Baking soda
1×10^{-10}	10	Ammonia
1×10^{-11}	11	
1×10^{-12}	12	Drain cleaner
1×10^{-13}	13	NaOH (4%)
1×10^{-14}	14	

Which substance is the most acidic?

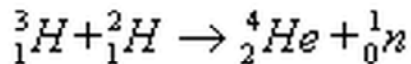
- a. Baking soda
 b. HCl
 c. Milk
 d. Lemon juice

_____ 63. Which of the following equations correctly represent fission?

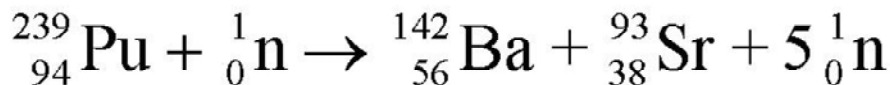
a.



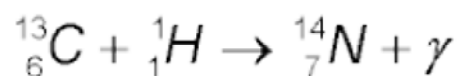
b.



c.



d.



_____ 64.

Results of Firing Alpha Particles at Gold Foil

Observation:	Proportion:
Alpha particles went straight through gold foil.	> 98%
Alpha particles went through gold foil but were deflected at large angles.	≈ 2%
Alpha particles bounced off gold foil.	≈ 0.01%

What information do the experimental results above reveal about the nucleus of the gold atom?

a. The nucleus contains small positive and negative particles.

b. The nucleus contains less than half the mass of the atom.

c. The nucleus is small and is the densest part of the atom.

d. The nucleus is large and occupies most of the atom's space.

_____ 65. How many oxygen atoms are there in 4.75 mol of Calcium Dichromate?

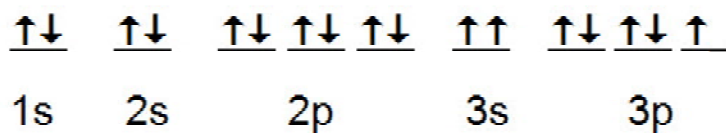
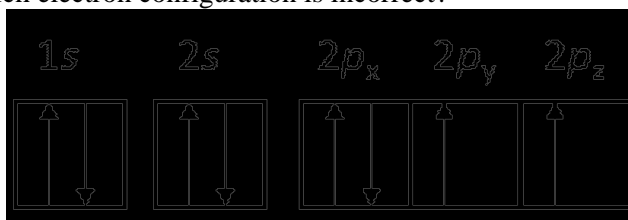
a. 3.01×10^{24} oxygen atoms

b. 52.5 oxygen atoms

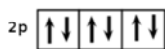
c. 2.00×10^{25} oxygen atoms

d. 7 oxygen atoms

66. Which electron configuration is incorrect?



b.



c.

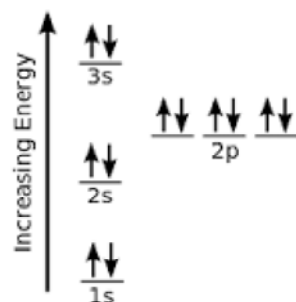


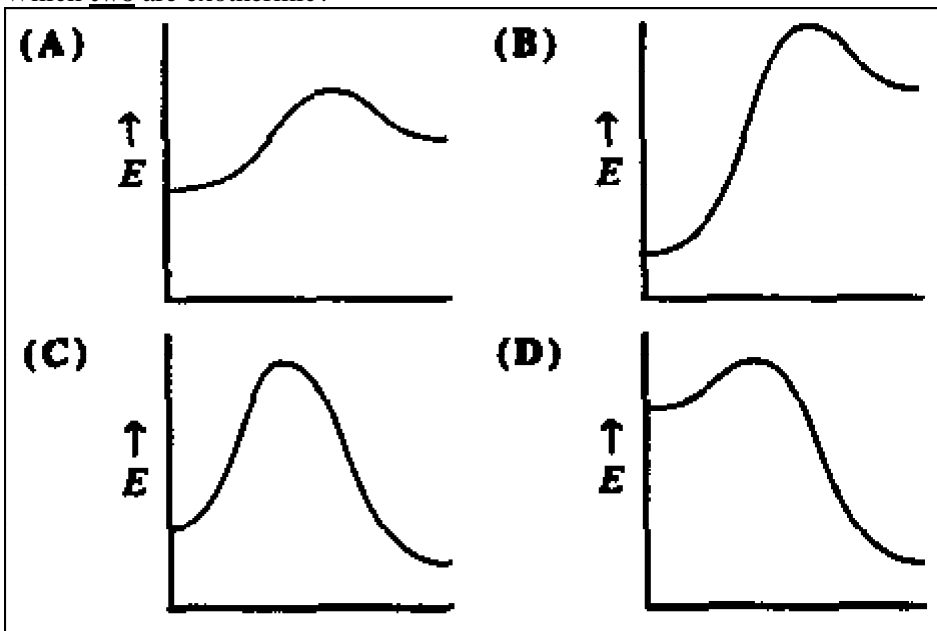
Table of Common Molecules				
Name	Hydrogen	Chlorine	Ammonia	Methane
Molecular Formula	H ₂	Cl ₂	NH ₃	CH ₄

67.

What type of bond do all of these compounds have in common?

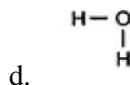
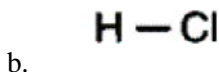
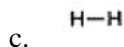
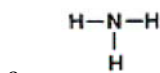
- a. Metallic
 b. Ionic
 c. Formula unit
 d. Covalent

- ___ 68. Choose the correct molecular shape for ammonia, NH_3 .
- trigonal pyramidal
 - bent
 - linear
 - trigonal planar
- ___ 69. How many moles of carbon-12 are contained in exactly 6 grams of carbon-12?
- 0.5 moles
 - 2.0 moles
 - 3.01×10^{23} moles
 - 6.02×10^{23} moles
- ___ 70. What type of reaction is the reaction below?
- $$\text{___ Fe}_2\text{O}_3 \rightarrow \text{___ Fe} + \text{___ O}_2$$
- Single Replacement
 - Synthesis/Combination
 - Combustion
 - Decomposition
- ___ 71. Which substance is the most basic?
- $\text{pH} = 3$
 - $\text{pOH} = 10$
 - $\text{pH} = 8$
 - $\text{pOH} = 3$
- ___ 72. Which of the following reactions illustrates amphoterism?
- $\text{H}_2\text{O} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{OH}^-$
 - $\text{NaOH} \rightleftharpoons \text{Na}^+ + \text{OH}^-$
 - $\text{HCl} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{Cl}^-$
 - $\text{NaCl} \rightleftharpoons \text{Na}^+ + \text{OH}^-$
- ___ 73. Determine the shape of SCl_2 :
- linear
 - bent
 - trigonal pyramidal
 - tetrahedral
- ___ 74. Which **two** are exothermic?



- A
- B
- C
- D

___ 75. Which structural formula represents a nonpolar molecule?



___ 76. Which intermolecular force is present in the compound CH_3NH_2 between the N and H? **Choose only the strongest force present.**

a. hydrogen bonding

c. dipole-dipole

b. dispersion

d. electrostatic



What kind of change will shift the reaction above to the right to form more products?

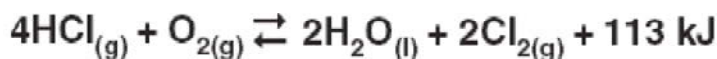
___ 77.

a. an increase in the pressure of NH_3

c. a decrease in temperature

b. a decrease in total pressure

d. an increase in the concentration of HCl



Which action will drive the reaction to the right?

___ 78.

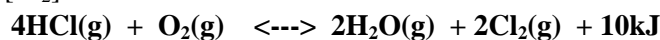
a. heating the equilibrium mixture

c. decreasing the oxygen concentration

b. increasing the system's pressure

d. adding water to the system

___ 79. An analysis of the equilibrium mixture in a 1-L flask gives the following results: $[\text{HCl}] = .30 \text{ mol}$, $[\text{O}_2] = .20 \text{ mol}$, $[\text{H}_2\text{O}] = 1.2 \text{ mol}$, and $[\text{Cl}_2] = .60$



Based on your answer for K_{eq} are the reactants or products favored?

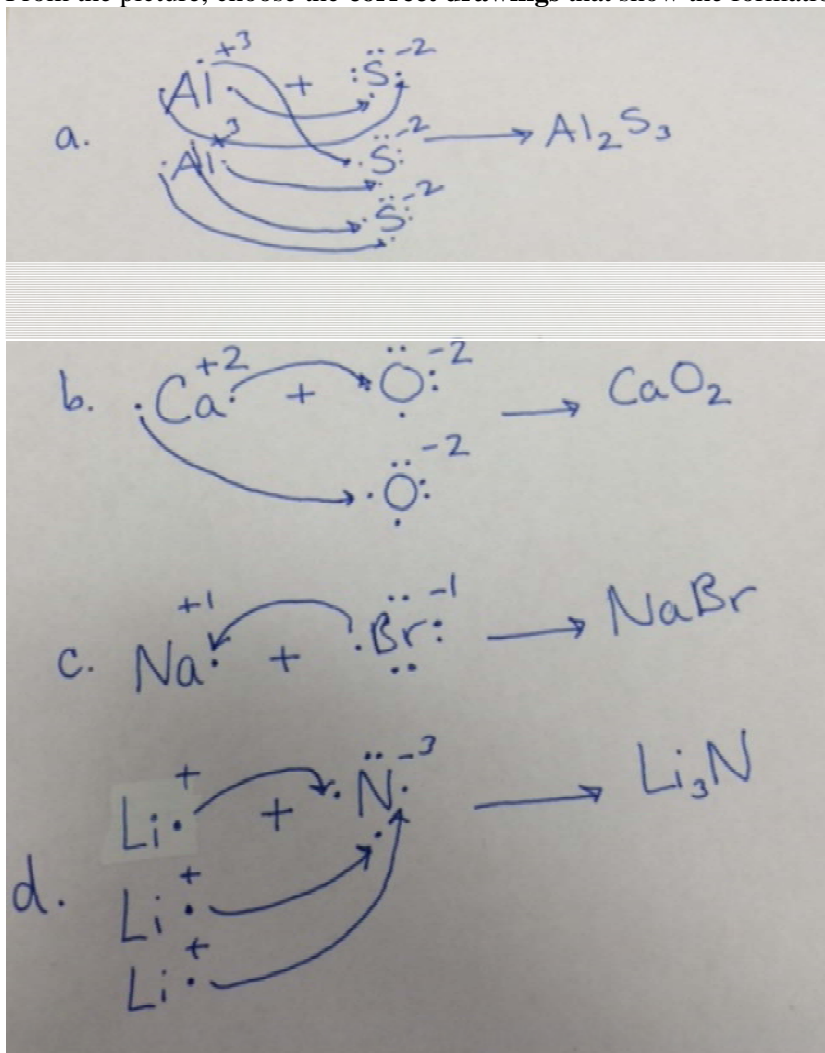
a. Reactants

c. Products

b. Both products and reactants

d. Heat

80. From the picture, choose the **correct drawings** that show the formation of an ionic compound.



- a. a
b. b
c. c
d. d

81. Which of the following are strong acids (**choose all that apply**)?

- a. HClO_4
b. HCN
c. HNO_3
d. H_2SO_3
e. HBr

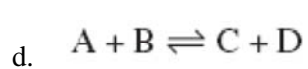
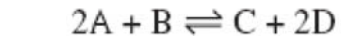
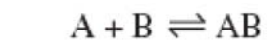
82. When hydrochloric acid and sodium hydroxide base are mixed they produce water and sodium chloride. Classify this type of reaction.

- a. single replacement
b. neutralization
c. combination
d. combustion

Name: _____

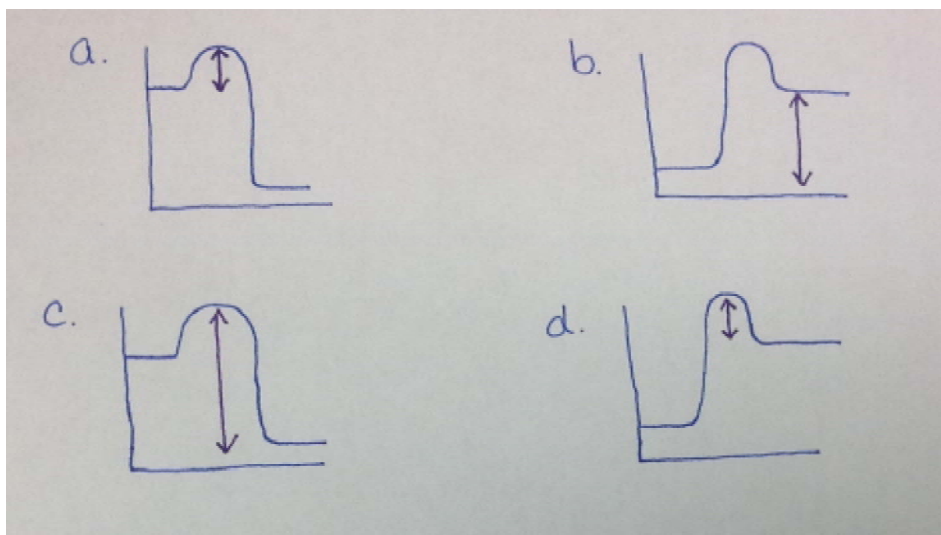
ID: A

83. In which of the following reactions involving gases would the forward reaction be favored by an increase in pressure?



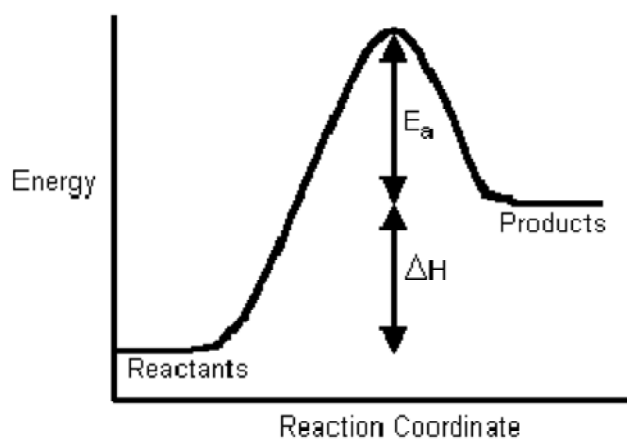
Problem

84. Which energy level diagram correctly shows the activation energy?

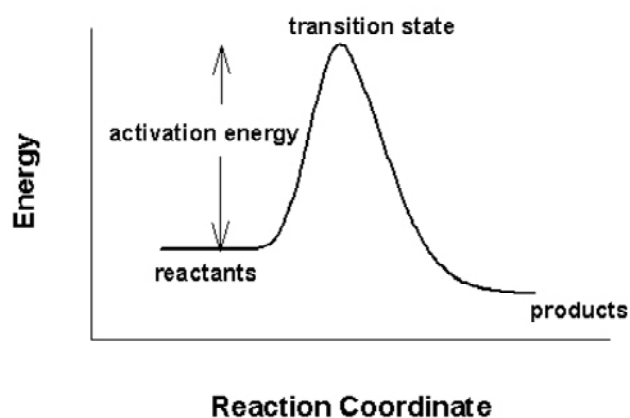


85. Which of the following pictures best represents an endothermic reaction?

A.



B.



It's time to say, "**Good-bye**". Our year has come to an end. We have made many cherished memories and many more new friends. I've watched you all learn and grow, and change from day to day. I hope that all the things we've done have helped in some small way. So it's with happy memories, I send you out the door with great hope and expectations for what next year holds in store. Have a great summer. :) Mrs. Z

Chem Final Spring 2017 Answer Section

MULTIPLE CHOICE

1. ANS: B
St. 7b

PTS: 1
2. ANS: B
ST 4E

PTS: 1
3. ANS: B PTS: 1
4. ANS: B PTS: 1 DIF: L2 REF: p. 139
OBJ: 5.3.1 STA: Ch.1.j
5. ANS: A PTS: 1 DIF: L2 REF: p. 307
OBJ: 10.3.1 STA: Ch.3
6. ANS: A PTS: 1
7. ANS: C PTS: 1 DIF: L2 REF: p. 591
OBJ: 19.1.2 STA: Ch.5.e
8. ANS: D
ST 2A, 2B

PTS: 1
9. ANS: B PTS: 1
10. ANS: D PTS: 1
11. ANS: A
St. 1c

PTS: 1 STA: 1c
12. ANS: A PTS: 1
13. ANS: B PTS: 1 DIF: L1 REF: p. 68 | p. 70
OBJ: 3.1.3
14. ANS: B PTS: 1
15. ANS: A PTS: 1
16. ANS: B PTS: 1
17. ANS: A PTS: 1
18. ANS: D
ST. 1
ST. 11.C

PTS: 1
19. ANS: B
ST. 3

PTS: 1

20. ANS: D
ST 2A, 2B
- PTS: 1
21. ANS: A PTS: 1 DIF: L2 REF: p. 257 | p. 261 | p. 262
OBJ: 9.2.2 STA: Ch.2
22. ANS: D
ST 3
- PTS: 1
23. ANS: A PTS: 1 DIF: L2 REF: p. 483 | p. 484
OBJ: 16.2.2 STA: Ch.6.d
24. ANS: A PTS: 1 DIF: L1 REF: p. 556
OBJ: 18.2.3 STA: Ch.9.c
25. ANS: D PTS: 1 DIF: L2 REF: p. 261 | p. 262 | p. 277
OBJ: 9.2.1 | 9.5.2 STA: Ch.5
26. ANS: D PTS: 1 STA: 3e
27. ANS: D PTS: 1 DIF: L1 REF: p. 588
OBJ: 19.1.1
28. ANS: E PTS: 1
29. ANS: B PTS: 1 DIF: Easy REF: Section: 14.1
OBJ: EK.6.A.3
30. ANS: D
ST 1B
- PTS: 1
31. ANS: C PTS: 1
32. ANS: A PTS: 1 DIF: L2 REF: p. 597 | p. 598
OBJ: 19.2.2 STA: Ch.5.d
33. ANS: B PTS: 1
34. ANS: D PTS: 1
35. ANS: B PTS: 1
36. ANS: C
Standard 1c
- PTS: 1
37. ANS: D PTS: 1
38. ANS: B PTS: 1
39. ANS: B PTS: 1 STA: 4d
40. ANS: A
St. 1c
- PTS: 1
41. ANS: A
3
- PTS: 1
42. ANS: D PTS: 1

43. ANS: A PTS: 1
44. ANS: A PTS: 1
45. ANS: B PTS: 1 STA: 3e
46. ANS: D
St. 7c

PTS: 1
47. ANS: B PTS: 1 DIF: Easy REF: Section: 1.7
OBJ: EK.1.A.2
48. ANS: B
ST. 1A, ST 2.A

PTS: 1
49. ANS: D PTS: 1 DIF: L2 REF: p. 481
OBJ: 16.2.1 STA: Ch.6.d
50. ANS: A PTS: 1 STA: 3a KEY: Balancing Equations
51. ANS: A PTS: 1 DIF: L1 REF: p. 476 | p. 477
OBJ: 16.1.4 STA: Ch.6.c
52. ANS: A PTS: 1 STA: 3d KEY: Mass to Representative Particles
53. ANS: C
ST. 1.E

PTS: 1
54. ANS: C PTS: 1
55. ANS: A PTS: 1
56. ANS: A PTS: 1 STA: 3d
KEY: density of a gas at STP; molar mass; molar volume
57. ANS: C PTS: 1 DIF: L2 REF: p. 356
OBJ: 12.1.2 STA: Ch.3.d
58. ANS: B PTS: 1
59. ANS: D PTS: 1 DIF: L2 REF: p. 375
OBJ: 12.3.2 STA: Ch.3.f
60. ANS: B
Standard 1c

PTS: 1 STA: 1c
61. ANS: B PTS: 1
62. ANS: B
5a

PTS: 1
63. ANS: C PTS: 1 DIF: L1 REF: p. 813
OBJ: 25.3.3 STA: Ch.11.b
64. ANS: C
St. 1.E
ST. 1.H

PTS: 1

65. ANS: C PTS: 1 STA: 3d
KEY: Moles to Representative Particles within formula
66. ANS: B PTS: 1 DIF: 2 REF: Page Ref: 6.8
OBJ: 6.8; G2
67. ANS: D
ST 2B

PTS: 1
68. ANS: A PTS: 1
69. ANS: A PTS: 1 STA: 3b KEY: Mass to Moles
70. ANS: D PTS: 1 STA: 3a KEY: Types of Reactions; Decomposition
71. ANS: D
5a

PTS: 1
72. ANS: A PTS: 1 DIF: L2 REF: p. 592
OBJ: 19.1.2 STA: Ch.5.e

MULTIPLE RESPONSE

73. ANS: B
2f

PTS: 1
74. ANS: C, D PTS: 1
75. ANS: C
2f

PTS: 1
76. ANS: A
2h

PTS: 1
77. ANS: B
9a

PTS: 1
78. ANS: B
9b

PTS: 1
79. ANS: C
9b

PTS: 1
80. ANS: A, D PTS: 1
81. ANS: A, C, E PTS: 1

82. ANS: B
5a

PTS: 1

83. ANS: A
9a

PTS: 1

PROBLEM

84. ANS:
B

PTS: 1

85. ANS:
A

PTS: 1