CHEM 1110 EXAM 1 FORM A February 26, 2007

This quiz will be machine-scored. Check to ensure that your WebCT ID is correctly coded beginning in the first column of the USER NAME section. Read each question carefully and mark only the best answer with pencil in the appropriate space on the answer sheet. You should also mark your answers on this sheet and keep it. Exam keys and grade results will be posted on WebCT as soon as available.

____ 33. Which of the following represents a physical change only?
a. Ozone is made from oxygen by lightning
b. Dew forms on grass at night
c. Gasoline fuel powers an automobile engine
d. A candle is ignited
e. A glass of milk is digested

____ 34. Which of the following name/formula pairs is INCORRECT?
a. sodium phosphide / Na_3P
b. potassium carbonate / K_2CO_3
c. barium nitrate / $BaNO_2$
d. iron (III) sulfate / $Fe_2(SO_4)_3$
e. magnesium chloride / $MgCl_2$

____ 35. An atomic mass unit (amu) is defined as...
a. 1/16 the mass of an oxygen atom
b. the mass of a proton
c. the mass of a hydrogen atom
d. 1/12 the mass of a carbon atom
e. the atomic weight of an element expressed in grams

____ 36. The percent chlorine in the pesticide DDT, $C_{14}H_9Cl_5$, is ...
a. 45.3 b. 50.0 c. 61.4 d. 52.1 e. 47.4

____ 37. Based on the balanced equation below, how many molecules of O_2 would react exactly with 8 molecules of ethane (C_2H_6)?

$$2\ C_2H_6 + 7\ O_2 \text{ ---------> } 4\ CO_2 + 6\ H_2O$$

a. 28 b. 16 c. 24 d. 14 e. 7

____ 38. A compound is composed of 70.6 % carbon, 5.9 % hydrogen, and 23.5 % oxygen. The molecular weight of this compound is 136. How many atoms of carbon are in one molecule of this compound?
a. 4 b. 5 c. 7 d. 8 e. 9

____ 39. How many moles of silicon atoms are contained in 53.5 g of silicon?
a. 1.91
b. 1.15×10^{24}
c. 1.67
d. 1.97×10^{-24}
e. 3.82

____ 40. How many grams of PbI_2 could be made from the complete reaction of 6.5 g of KI with excess lead nitrate, according to the following equation.

$$Pb(NO_3)_2 + 2\ KI \text{ ------> } PbI_2 + 2\ KNO_3$$

a. 2.3 g b. 9.0 g c. 18 g d. 36 g e. 3.2 g

____ 41. In a homogeneous mixture, the material, typically in lesser amount, that is dissolved is the ...
a. solvent
b. solution
c. solute
d. concentrate
e. diluent

____ 42. Determine the formula weight of bismuth sulfate, $Bi_2(SO_4)_3$.
a. 257 amu b. 353 amu c. 433 amu d. 514 amu e. 706 amu

____ 43. Which of the following is NOT the same as 0.719 grams?
a. 71.9 cg
b. 7.19×10^{-4} kg
c. 7.19×10^{8} ng
d. 7.19×10^{-2} mg
e. 7.19×10^{5} υg

____ 44. If 25.0 mL of 18.0 M sulfuric acid (H_2SO_4) is diluted to 500 mL, the molarity of the dilute solution is ...
a. 3.6 M b. 1.1 M c. 0.90 M d. 0.72 M e. 6.9 M

For questions 45-47 which follow, 2.50 g of aluminum and 2.50 g of oxygen are reacted to produce 3.50 g of aluminum oxide. The equation for the process is...

$$4\ Al + 3\ O_2 \text{ -------> } 2\ Al_2O_3$$

____ 45. Once the limiting reagent is consumed, how much Al_2O_3 will be produced?
a. 3.98 g b. 6.30 g c. 4.72 g d. 2.50 g e. 5.31 g

____ 46. Which of the following would be left after the reaction is complete?
a. 0.31 g O_2
b. 0.31 g Al
c. 0.28 g Al
d. 0.28 g O_2
e. None of these are correct

____ 47. What is the percent yield of this reaction?
a. 74.1 b. 52.9 c. 71.4 d. 66.0 e. 88.6

____ 48. All of the following are ionic compounds except ...
a. K_2O b. Na_2SO_4 c. $SiCl_4$ d. NaCl e. Li_3N

____ 49. Which of the following is NOT the correct symbol for the element given?
a. Oxygen - O
b. Sodium - Sm
c. Nitrogen - N
d. Fluorine - F
e. Chlorine - Cl

____ 50. The mass of a single phophorus atom is ...
a. 31 g
b. 15 amu
c. 3.1×10^{-23} g
d. 1.9×10^{25} g
e. 5.1×10^{-23} g

____ 51. A 20.0 % zinc chloride ($ZnCl_2$) solution has a density of 1.19 g/mL. What is the molarity of this solution?
a. 23.8 M b. 0.147 M c. 8.75 M d. 0.228 M e. 1.75 M

____ 52. We know ethanol (grain alcohol) is a pure substance and not a mixture because ...
a. its composition is constant
b. it is clear and colorless
c. it is a liquid
d. it can be vaporized
e. it is flammable

____ 53. What is the molarity of a solution which contains 48.0 g of nickel sulfate ($NiSO_4$) dissolved in 450 mL of solution?
a. 0.31 M b. 1.1 M c. 9.4 M d. 0.69 M e. 7.2 M

____ 54. How many aluminum atoms must be laid end-to-end to form a line one meter long? The radius of an aluminum atom is 0.143 nm.
a. 6.99×10^{9}
b. 1.40×10^{9}
c. 1.60×10^{23}
d. 3.50×10^{9}
e. 2.00×10^{7}

____ 55. A metal oxide has the formula M_2O_3 and is composed of 66.6 % metal and 33.4 % oxygen. What is the identity of the metal M?
a. Al b. Fe c. Ti d. Tl e. Cr

____ 56. Which of the following contains exactly 1.0 mole of oxygen *atoms*?
a. 6.6×10^{-23} g NaOH
b. 21 g HNO_3
c. 6.02×10^{23} molecules CO_2
d. 98 g H_2SO_4
e. 32 amu O_2

____ 57. Which of the following statements about matter is INCORRECT?
a. Elements are pure substances
b. All matter exists in either the gas, liquid or solid state
c. Heterogeneous mixtures can be separated by physical means
d. Compounds are homogeneous mixtures

____ 58. When balanced, the coefficient of Fe_3O_4 in the following equation is ...

___ Al + ___ Fe_3O_4 --------> ___ Al_2O_3 + ___ Fe

a. 2 b. 3 c. 4 d. 5 e. 9

____ 59. What volume of 3.00 M hydrochloric acid (HCl) is needed to react with 3.75 g of ferric oxide (Fe_2O_3)? The equation for the process is...

$$Fe_2O_3 + 6\ HCl \text{ -------> } 2\ FeCl_3 + 3\ H_2O$$

a. 23.4 mL b. 47.0 mL c. 7.50 L d. 11.7 mL e. 140 mL

____ 60. Which test form are you taking?
a. A b. B c. C d. D

CHEM 1110-001
Exam 1 Keys
(See Form A to correlate with questions on other forms.)

	Test Form			
Question #	**A**	**B**	**C**	**D**
33	b	d	c	a
34	c	d	b	e
35	d	b	a	c
36	b	a	d	b
37	a	d	c	d
38	d	c	b	a
39	a	e	e	b
40	b	b	a	e
41	c	a	c	c
42	e	d	e	d
43	d	c	c	b
44	c	c	a	b
45	c	a	d	a
46	d	c	c	a
47	a	a	e	a
48	c	c	a	a
49	b	c	c	c
50	e	e	d	c
51	e	c	a	c
52	a	a	c	b
53	d	b	c	b
54	d	c	d	e
55	c	c	c	b
56	b	a	d	b
57	d	e	c	e
58	b	d	a	b
59	b	c	b	d