Ch.11-Q2W6- H.W.- Chemical quantities

True/ Indica		hether the statement is true or false.					
	1.	The percent yield is the maximum amount of product that can be produced from a given amount of reactant.					
	2.	The molecular formula for a compound is the formula with the smallest whole-number mole ratio of the elements.					
Multi Identij	-	Choice ethat best completes the statement or answers the question.					
	3.	Copper reacts with 36.7 g of silver nitrate to produce copper(II) nitrate and silver. Determine the theoretical yield of Cu(NO ₃) ₂ if the actual yield is 31.29 g. a. 0.773 g c. 12.9 g					
	4.	 b. 40.5 g d. 77.3 g Hydrofluoric acid reacts with 31.3 g of silica to produce hexafluorosilicic acid. Determine the percent yield of H₂SiF₆ if the actual yield is 60.3 g. a. 31.8% b. 0.818% c. 81.8% d. 12.2% 					
	5.	How many moles of carbon dioxide is produced when 10.4 mol of propane gas is burned in excess oxygen? a. 31.2 mol b. 0.288 mol c. 52.0 mol d. 3.46 mol					
	6.	What is the mass of potassium chloride when 2.50 g of potassium reacts with excess of chlorine gas? a. 728 g b. 4.77 g d. 9.52 g					
	7.						
	8.	How many grams of water are produced when 2.50 mol oxygen reacts with hydrogen? a. 45.0 g b. 22.5 g c. 0.277 g d. 90.0 g					
Comp	oletio	A. stoichiometry B. empirical formula C. formula mass D. Avogadro constant. E. mole					
	9. 10. 11.	The number of items contained in one mole of any substance is called the There are 6.02×10^{23} paper clips in a of paper clips. The mass in atomic mass units of one formula unit of a compound is the of the compound.					
	12.	The of a compound expresses the smallest whole number ratio of the atoms in the compound.					
	13.	The amount of product of a chemical reaction can be predicted by					
	14.	The compounds CH_2O and $C_6H_{12}O_6$ have the same					
	15.	A unit of measure used to count the number of atoms, molecules, or formula units of a substance is the					

Matching

		Match each item with t	he correct item below.				
		a. formula mass					
		b. ideal gas lawc. study that relates mass to number of particles					
		c. study that relates nd. percent yield	iass to number of partic	ries			
		e. one molecule or or	ie mole				
		f. 6.02×10^{23}	ic more				
		g. 0.10 mole					
		h. molar mass					
		i. molar volume					
		j. 0.25 mole					
		k. $8.31 \text{ kPa} \cdot \text{L/mol} \cdot$	K				
		1. atomic mass unit					
		m. empirical formula					
	16.						
		2 g of H ₂ CO ₂					
		58.5 u of NaCl					
		stoichiometry					
		ratio of mass of produc	t obtained to mass expe	ected			
		Avogadro constant	t obtained to mass expe	ected			
		2.24 L of a gas at STP					
	24.	_					
		PV = nRT					
		NaCl					
	27.	22.4 L					
	28.	$24.5 \text{ g of } H_2SO_4$					
Short	Ansv		1	-4	and CHOUN by the order of the law of		
	A chemical plant is being designed to manufacture ethanol (ethyl alcohol; C_2H_5OH) by treating ethylene (ethene; C_2H_4) gas with water, using phosphoric acid as a catalyst. Answer the following questions about to process.						
	29.	Suppose that ethylene is to be supplied to the reaction chamber at the rate of 100.0L per minute at 300.0°C and $7.00 \times 10^{3} \text{kPa}$. At what rate in moles per minute is ethylene being supplied to the reaction chamber?					
		A. 127 mol/min	B. 147 mol/min	C. 167 mol/min	D. 187 mol/min		
	30.	30. In the first pass of ethene through the reaction chamber, the actual rate of production of a What is the percent yield for the reaction?			of production of ethanol is 271 g/min.		
		A. 2.00 percent	B. 4.00 percent	C. 6.00 percent	D. 8.00 percent		
	31.	. If the unused ethene is passed through the reaction chamber again, 12.8 moles of ethanol are produced, compared to a theoretical yield of 13.2 moles. What is the percent yield?					
		A. 91.0 percent	B. 93.0 percent	C. 95.0 percent	D. 97.0 percent		

32.	What is the anticipated rate in grams per minute at which ethanol will be formed under the conditions described above?				
	A. 6.77×10^3 g/s	/min B. 8.	$77 \times 10^3 \text{ g/min}$	C. $10.77 \times 10^3 \text{ g/s}$	min D. 12.77×10^3 g/min
33.	What is the mass in grams of 0.30 mol of NaHCO ₃ ?				
	A. 21.2 g	B. 23.2 g	C. 25.2 g	D. 27.2 g	
34.	What is the volume of 0.625 mol of nitrogen at 74.2 kPa and 85°C?				
	A. 25.1 L	B. 27.1 L	C. 29.1 L	D. 315.1 L	
35.	Determine the p	percent fluoring	e in the followir	g fluoride of chromiu	ım.
	chromium(II) fl	luoride, CrF ₂			
	A. 36.2%	В. 38	.2%	C. 40.2%	D. 42.2%
36.	36. What volume of hydrogen gas can be produced by reacting 3.86 g of aluminum in excess hydrochloric ac 21.0°C and 102 kPa? The reaction is $2Al(s) + 6HCl(aq) \rightarrow 2AlCl_3(aq) + 3H_2(g)$.				•
	A. 4.14 L	B. 5.1	4 L	C. 6.14 L	D. 7.14 L
37.	Calcium oxide can be prepared by heating calcium metal in oxygen according to the reaction: $2Ca + O_2 \rightarrow 2CaO$. How much calcium would be needed to make 15.0 g of calcium oxide?				
	A. 10.7 g	B. 11	0.7 g	C. 12.7 g	D. 13.7 g
38.	Methylal is a compound that is used in perfumery. Methylal is 47.3 percent C, 10.6 percent H, and 42.1 percent O. The molar mass is approximately 76 g/mol. What is the molecular formula of methylal?				
	A. C_3H_8O	B. C ₃	H_6O_2	$C. C_3H_8O_2$	D. CH_8O_2
39.	Hydrogen gas reacts with copper(II) oxide to form copper metal and water vapor according to the reaction: $CuO + H_2 \rightarrow Cu + H_2O$. What mass of copper is produced if 255 L of hydrogen at STP are used up in this reaction?				
	A. 723 g	B. 82	.3 g	C. 911 g	D. 923 g
40.	. How many atoms are there in 106.2 g of potassium?				
	A. 14.4×10^{23} a C. 18.4×10^{23} a			5.4×10^{23} atoms 0.4×10^{23} atoms	

Problem

Nitrogen and oxygen combine with each other to form a series of compounds. This chart summarizes laboratory research done on this series of compounds. From the data supplied, calculate the empirical and molecular formulas for each oxide listed.

Compound	Percentage Nitrogen	Percentage Oxygen	Molecular Mass
A	63.6	36.4	44.01 u
В	30.4	69.6	46.00 u
С	36.9	63.1	76.01 u
D	25.9	74.1	108.01 u
Е	46.7	53.3	30.01 u

	A. N_2O_3	B. N_2O_5	$C. N_2O$	D. NO
41.	Compound D is			
42.	Compound C is			
43.	Compound A is			

44. In a reaction, 82.00 g of sodium reacts with 74.00 g of ferric oxide to form sodium oxide and iron metal. Calculate the mass of solid iron produced. 51.36 g

A. 51.36 g

B. 61.36 g

C. 71.36 g

D. 81.36 g

45. In a reaction, 10.76 g of CaCO₃, 10.51 g of HCl, and excess water produced 10.26 g of CaCl₂·6H₂O. Calculate the theoretical yield of calcium chloride hexahydrate. 23.56 g

A. 17.56 g

B. 19.56 g

C. 21.56 g

D. 23.56 g
