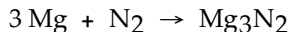


Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

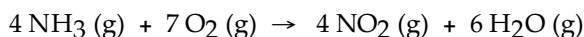
- 1) Magnesium and nitrogen react in a combination reaction to produce magnesium nitride: 1) _____



In a particular experiment, a 9.27-g sample of N_2 reacts completely. The mass of Mg consumed is _____ g.

- A) 24.1 B) 8.04 C) 13.9 D) 0.92 E) 16.1

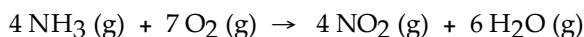
- 2) The combustion of ammonia in the presence of excess oxygen yields
- NO_2
- and
- H_2O
- : 2) _____



The combustion of 28.8 g of ammonia consumes _____ g of oxygen.

- A) 54.1 B) 108 C) 15.3 D) 28.8 E) 94.7

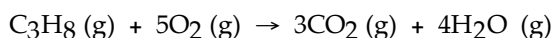
- 3) The combustion of ammonia in the presence of excess oxygen yields
- NO_2
- and
- H_2O
- : 3) _____



The combustion of 43.9 g of ammonia produces _____ g of NO_2 .

- A) 2.58 B) 43.9 C) 0.954 D) 178 E) 119

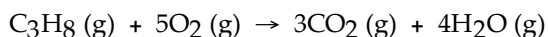
- 4) The combustion of propane (
- C_3H_8
-) produces
- CO_2
- and
- H_2O
- : 4) _____



The reaction of 2.5 mol of O_2 will produce _____ mol of H_2O .

- A) 4.0 B) 3.0 C) 2.5 D) 2.0 E) 1.0

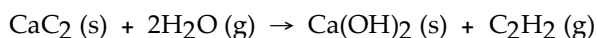
- 5) The combustion of propane (
- C_3H_8
-) in the presence of excess oxygen yields
- CO_2
- and
- H_2O
- : 5) _____



When 2.5 mol of O_2 are consumed in their reaction, _____ mol of CO_2 are produced.

- A) 2.5 B) 3.0 C) 6.0 D) 1.5 E) 5.0

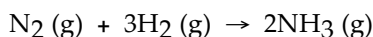
- 6) Calcium carbide (
- CaC_2
-) reacts with water to produce acetylene (
- C_2H_2
-): 6) _____



Production of 13 g of C_2H_2 requires consumption of _____ g of H_2O .

- A)
- 4.8×10^2
- B) 4.5 C)
- 4.8×10^{-2}
- D) 9.0 E) 18

- 7) Under appropriate conditions, nitrogen and hydrogen undergo a combination reaction to yield ammonia: 7) _____



A 7.1-g sample of N_2 requires _____ g of H_2 for complete reaction.

- A) 1.2 B) 0.51 C) 17.2 D) 0.76 E) 1.5

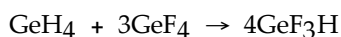
- 8) Lead (II) carbonate decomposes to give lead (II) oxide and carbon dioxide: 8) _____



How many grams of lead (II) oxide will be produced by the decomposition of 2.50 g of lead (II) carbonate?

- A) 2.09 B) 0.41 C) 2.61 D) 2.50 E) 0.00936

- 9) GeF_3H is formed from GeH_4 and GeF_4 in the combination reaction: 9) _____



If the reaction yield is 92.6%, how many moles of GeF_4 are needed to produce 8.00 mol of GeF_3H ?

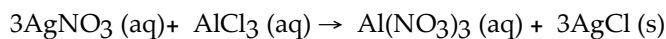
- A) 2.78 B) 5.56 C) 2.16 D) 3.24 E) 6.48

- 10) What mass in grams of hydrogen is produced by the reaction of 4.73 g of magnesium with 1.83 g of water? 10) _____



- A) 0.0485 B) 0.204 C) 0.0162 D) 0.102 E) 0.219

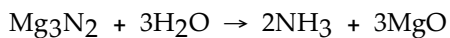
- 11) Silver nitrate and aluminum chloride react with each other by exchanging anions: 11) _____



What mass in grams of AgCl is produced when 4.22 g of AgNO_3 react with 7.73 g of AlCl_3 ?

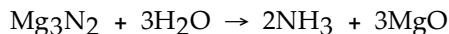
- A) 4.22 B) 3.56 C) 11.9 D) 17.6 E) 24.9

- 12) How many moles of magnesium oxide are produced by the reaction of 3.82 g of magnesium nitride with 7.73 g of water? 12) _____



- A) 0.114 B) 0.0378 C) 0.0756 D) 4.57 E) 0.429

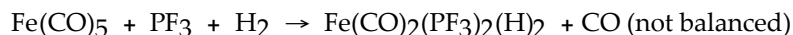
- 13) A 3.82-g sample of magnesium nitride is reacted with 7.73 g of water. 13) _____



The yield of MgO is 3.60 g. What is the percent yield in the reaction?

- A) 46.6 B) 99.9 C) 78.7 D) 49.4 E) 94.5

- 14) Pentacarbonyliron ($\text{Fe}(\text{CO})_5$) reacts with phosphorous trifluoride (PF_3) and hydrogen, releasing carbon monoxide: 14) _____



The reaction of 5.0 mol of $\text{Fe}(\text{CO})_5$, 8.0 mol of PF_3 and 6.0 mol of H_2 will release _____ mol of CO.

- A) 5.0 B) 15 C) 24 D) 6.0 E) 12

- 15) What is the maximum mass in grams of NH_3 that can be produced by the reaction of 1.0 g of N_2 with 3.0 g of H_2 via the equation below? 15) _____



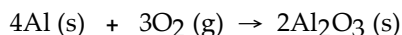
- A) 1.2 B) 2.0 C) 4.0 D) 17 E) 0.61

- 16) What is the maximum amount in grams of SO_3 that can be produced by the reaction of 1.0 g of S with 1.0 g of O_2 via the equation below? 16) _____



- A) 0.27 B) 2.5 C) 1.7 D) 2.0 E) 3.8

- 17) Solid aluminum and gaseous oxygen react in a combination reaction to produce aluminum oxide: 17) _____

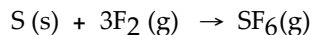


The maximum amount of Al_2O_3 that can be produced from 2.5 g of Al and 2.5 g of O_2 is

_____ g.

- A) 9.4 B) 5.3 C) 7.4 D) 5.0 E) 4.7

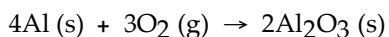
- 18) Sulfur and fluorine react in a combination reaction to produce sulfur hexafluoride: 18) _____



The maximum amount of SF_6 that can be produced from the reaction of 3.5 g of sulfur with 4.5 g of fluorine is _____ g.

- A) 5.8 B) 16 C) 8.0 D) 12 E) 3.2

- 19) Solid aluminum and gaseous oxygen react in a combination reaction to produce aluminum oxide: 19) _____

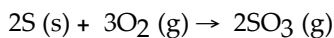


In a particular experiment, the reaction of 2.5 g of Al with 2.5 g of O₂ produced 3.5 g of Al₂O₃.

The % yield of the reaction is _____.

- A) 26 B) 74 C) 47 D) 66 E) 37

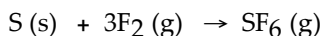
- 20) Sulfur and oxygen react in a combination reaction to produce sulfur trioxide, an environmental pollutant: 20) _____



In a particular experiment, the reaction of 1.0 g S with 1.0 g O₂ produced 0.80 g of SO₃. The % yield in this experiment is _____.

- A) 29 B) 30 C) 21 D) 88 E) 48

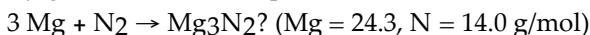
- 21) Sulfur and fluorine react in a combination reaction to produce sulfur hexafluoride: 21) _____



In a particular experiment, the percent yield is 79.0%. This means that in this experiment, a 7.90 -g sample of fluorine yields _____ g of SF₆.

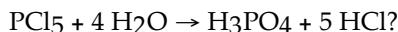
- A) 0.110 B) 10.1 C) 7.99 D) 24.0 E) 30.3

- 22) How many grams of N₂ are required to react with 2.30 moles of Mg in the following process? 22) _____



- A) (2.30)(3)(28.0)
B) (2.30/3)(28.0)
C) (2.30/3)/28.0
D) (2.30)(28.0)
E) (2.30/3)

- 23) How many moles of H₃PO₄ are produced when 20.0 g of HCl are produced by the reaction 23) _____



(P = 31.0, Cl = 35.5, H = 1.0, O = 16.0 g/mol)

- A) (20.0/36.5)/5
B) (20.0/35.5)/5
C) (20.0/36.5)
D) (20.0/98.0)/5
E) (20.0/98.0)

- 24) For the reaction $2\text{Al} + \text{Fe}_2\text{O}_3 \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$, 2.5 g of Al (27.0 g/mol) and 7.2 g of Fe₂O₃ (159.8 g/mol) produce how many g of Fe (55.9 g/mol)? 24) _____

- A) 7.2 (55.9/158.9)
B) 2.5 (55.9/27.0)
C) 2.5 (55.9)(2)/(27.0)(2)
D) 7.2 (55.9)(2)/158.9
E) 2.5 (55.9/158.9)

- 25) Which metal will produce the most hydrogen per gram of metal? 25) _____
 A) $\text{Mg} + 2 \text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
 B) $\text{Sn} + 4 \text{HCl} \rightarrow \text{SnCl}_4 + 2 \text{H}_2$
 C) $2 \text{Li} + 2 \text{HCl} \rightarrow 2 \text{LiCl} + \text{H}_2$
 D) $2 \text{Fe} + 6 \text{HCl} \rightarrow 2 \text{FeCl}_3 + 3 \text{H}_2$
 E) $2 \text{Cr} + 6 \text{HCl} \rightarrow 2 \text{CrCl}_3 + 3 \text{H}_2$
- 26) Gases emitted during volcanic activity often contain high concentrations of hydrogen sulfide and sulfur dioxide. These gases may react to produce deposits of sulfur according to the equation:
 $2 \text{H}_2\text{S}(\text{g}) + \text{SO}_2(\text{g}) \rightarrow 3 \text{S}(\text{s}) + 2 \text{H}_2\text{O}(\text{g})$
 For the complete reaction of 6.41 mol of hydrogen sulfide:
 A) 628 g of total reactants are consumed
 B) 308 g of sulfur is formed
 C) 320 g of total products result
 D) 410 g of sulfur dioxide is consumed
 E) 231 g of water vapor is produced
- 27) 24.0 g of ethane (C_2H_6) are burned to form CO_2 and H_2O . How many grams of CO_2 are produced? 27) _____
 A) 70.3 g B) 32.8 g C) 43.2 g D) 14.4 g E) 35.1 g
- 28) Given the following reaction: 28) _____
 $\text{Na}_2\text{SO}_4(\text{s}) + 2 \text{C}(\text{s}) \rightarrow \text{Na}_2\text{S}(\text{s}) + 2 \text{CO}_2(\text{g})$
 How many grams of carbon are required to produce 18.4 g $\text{Na}_2\text{S}(\text{s})$?
 A) 2.83 g B) 11.3 g C) 239 g D) 142 g E) 5.66 g
- 29) The chemical reaction occurring during the discharge of a lead storage battery can be represented by the equation: $\text{Pb}(\text{s}) + \text{PbO}_2(\text{s}) + 2 \text{H}_2\text{SO}_4(\text{aq}) \rightarrow 2 \text{PbSO}_4(\text{s}) + 2 \text{H}_2\text{O}(\text{l})$ 29) _____
 What mass of lead sulfate would result from the complete reaction of 41.4 g of lead?
 A) 121 g B) 115 g C) 60.5 g D) 105 g E) 57.6 g
- 30) A 1.900 g sample of C_6H_{12} is burned in an excess of oxygen. What mass of CO_2 and H_2O should be obtained? 30) _____
 A) 10.45 g CO_2 , 4.27 g H_2O
 B) 0.994 g CO_2 , 0.407 g H_2O
 C) 2.98 g CO_2 , 1.22 g H_2O
 D) 5.96 g CO_2 , 2.44 g H_2O
 E) 5.23 g CO_2 , 2.38 g H_2O
- 31) How much Cl_2 , in g, is required to produce 12.0 g CCl_4 according to the following reaction? 31) _____
 $\text{CH}_4 + 4 \text{Cl}_2 \rightarrow \text{CCl}_4 + 4 \text{HCl}$
 A) 11.0 g B) 5.52 g C) 12.0 g D) 1.38 g E) 22.1 g
- 32) Given the reaction: 32) _____
 $2 \text{KMnO}_4 + 10 \text{KI} + 8 \text{H}_2\text{SO}_4 \rightarrow 6 \text{K}_2\text{SO}_4 + 2 \text{MnSO}_4 + 5 \text{I}_2 + 8 \text{H}_2\text{O}$
 How many moles of H_2SO_4 are required to produce 2.0 moles of I_2 , given the other reactants are in excess?
 A) 1.3 mol B) 1.6 mol C) 3.2 mol D) 4.0 mol E) 0.80 mol

- 33) Given the reaction: 33) _____

$$2 \text{KMnO}_4 + 10 \text{KI} + 8 \text{H}_2\text{SO}_4 \rightarrow 6 \text{K}_2\text{SO}_4 + 2 \text{MnSO}_4 + 5 \text{I}_2 + 8 \text{H}_2\text{O}$$

 How many moles of I_2 are produced by reacting 28.0 g KMnO_4 , 18.0 g KI and 46.0 g H_2SO_4 ?
 A) 0.108 mol
 B) 0.0542 mol
 C) 0.886 mol
 D) 0.293 mol
 E) 0.443 mol
- 34) The chemical reaction during low current discharge of a simple "dry cell" involves: 34) _____
 (unbalanced) $\text{Zn} + \text{MnO}_2 + \text{NH}_4\text{Cl} \rightarrow \text{ZnCl}_2 + \text{Mn}_2\text{O}_3 + \text{NH}_3 + \text{H}_2\text{O}$
 What is the coefficient for zinc in the balanced equation, and what is the limiting reagent for a process in which equal masses of reactants are mixed?
 A) 1/ MnO_2 B) 1/ Zn C) 2/ NH_4Cl D) 2/ MnO_2 E) 2/ Zn
- 35) What is the percent yield if 185 grams of SiO_2 are made from 328 g of Cr_2O_3 by the following 35) _____
 equation?

$$3 \text{Si(s)} + 2 \text{Cr}_2\text{O}_3\text{(s)} \rightarrow 3 \text{SiO}_2\text{(s)} + 4 \text{Cr(l)}$$

 A) 142% B) 95% C) 56% D) 105% E) 70%
- 36) What is the percent yield if 122 grams of SiO_2 are made from 246 g of Cr_2O_3 by the following 36) _____
 equation?

$$3 \text{Si(s)} + 2 \text{Cr}_2\text{O}_3\text{(s)} \rightarrow 3 \text{SiO}_2\text{(s)} + 4 \text{Cr(l)}$$

 A) 83.6% B) 59.3% C) 49.6% D) 125% E) 33.1%
- 37) If 0.500 mol of CaCl_2 is mixed with 0.200 mol Na_3PO_4 , the maximum amount in moles of 37) _____
 $\text{Ca}_3(\text{PO}_4)_2$ that can be formed is:
 A) 0.10 B) 0.50 C) 0.67 D) 0.20 E) 0.17
- 38) Consider the equation: 38) _____

$$2 \text{Na} + 2 \text{H}_2\text{O} \rightarrow 2 \text{NaOH} + \text{H}_2$$

 If 92.0 g of sodium is reacted with 76.0 g of water until the reaction goes to completion, which reactant will remain and in what quantity?
 A) 10.0 g sodium
 B) 43.5 g sodium
 C) 72.0 g water
 D) 10.0 g water
 E) 3.9 g water
- 39) 42.6 g Cu are combined with 84.0 g of HNO_3 according to the reaction: 39) _____

$$3 \text{Cu} + 8 \text{HNO}_3 \rightarrow 3 \text{Cu}(\text{NO}_3)_2 + 2 \text{NO} + 4 \text{H}_2\text{O}$$

 Which reagent is limiting and how many grams of $\text{Cu}(\text{NO}_3)_2$ are produced?
 A) HNO_3 , 93.8 g
 B) HNO_3 , 125.6 g
 C) Cu , 125.6 g
 D) Cu , 93.8 g
 E) $\text{Cu}(\text{NO}_3)_2$, 125.6 g

- 40) Consider the gaseous reaction: 40) _____

$$\text{N}_2\text{H}_4(\text{g}) + 3 \text{O}_2(\text{g}) \rightarrow 2 \text{NO}_2(\text{g}) + 2 \text{H}_2\text{O}(\text{g})$$

 If the above reaction has a percent yield of 98.5%, what mass in grams of oxygen is needed to produce 49.0 g of $\text{NO}_2(\text{g})$?
 A) 25.9 g B) 23.1 g C) 51.9 g D) 11.5 g E) 50.4 g
- 41) Chromium in its +VI oxidation state is considered a hazardous, carcinogenic species, destruction of which may be accomplished by the process symbolized as: 41) _____

$$4 \text{Zn} + \text{K}_2\text{Cr}_2\text{O}_7 + 7 \text{H}_2\text{SO}_4 \rightarrow 4 \text{ZnSO}_4 + 2 \text{CrSO}_4 + \text{K}_2\text{SO}_4 + 7 \text{H}_2\text{O}$$

 If 1.0 mol of each reactant is mixed, what is the limiting reagent, and what is the theoretical yield of chromium(II) sulfate?
 A) H_2 , 1.0 mol
 B) Zn, 0.50 mol
 C) H_2SO_4 , 0.29 mol
 D) $\text{K}_2\text{Cr}_2\text{O}_7$, 2.0 mol
 E) no limiting reagent, 1.0 mol
- 42) Given the reaction: 42) _____

$$\text{P}_4(\text{l}) + 6 \text{Cl}_2(\text{g}) \rightarrow 4 \text{PCl}_3(\text{l})$$

 If the percent yield is 82%, what mass of P_4 is required to obtain 2.30 g PCl_3 (Cl_2 in excess)?
 A) 0.16 g B) 0.43 g C) 0.52 g D) 0.63 g E) 0.95 g
- 43) In the following reaction: 43) _____

$$2 \text{KClO}_3(\text{s}) \rightarrow 2 \text{KCl}(\text{s}) + 3 \text{O}_2(\text{g})$$

 14.0 g KClO_3 yielded 1.40 g KCl . What is the percent yield?
 A) 16.4% B) 10.0% C) 32.9% D) 6.08% E) 11.0%
- 44) Cryolite is a compound needed for the Hall–Heroult process for producing aluminum. Cryolite is produced by the following reaction: 44) _____

$$6 \text{HF} + \text{Al}(\text{OH})_3 + 3 \text{NaOH} \rightarrow \text{Na}_3\text{AlF}_6 + 6 \text{H}_2\text{O}$$

 How many grams of cryolite are produced if the reaction has a 94.3% yield and a limiting reagent of 27.8 grams of HF?
 A) 15.9 B) 275 C) 48.6 D) 15.0 E) 45.8

Answer Key

Testname: CALCULO ESTEQUIOMETRICO

- 1) A
- 2) E
- 3) E
- 4) D
- 5) D
- 6) E
- 7) E
- 8) A
- 9) E
- 10) D
- 11) B
- 12) A
- 13) C
- 14) E
- 15) A
- 16) C
- 17) E
- 18) A
- 19) B
- 20) E
- 21) C
- 22) B
- 23) A
- 24) D
- 25) C
- 26) B
- 27) A
- 28) E
- 29) A
- 30) D
- 31) E
- 32) C
- 33) B
- 34) A
- 35) B
- 36) A
- 37) A
- 38) E
- 39) A
- 40) C
- 41) C
- 42) D
- 43) A
- 44) E