

Use your Scantron to answer questions 1-33. Each answer is worth 2 pt. There is only one answer per question unless it states otherwise.

Chp 5 (Chemical Reactions, Equations and Stoichiometry)

1. Indicate the missing words in the following statement: "For an ordinary chemical reaction the mass of the products is _____ the mass of the reactants."

- A) usually more than B) always less than C) usually less than **D) always equal to**

2. Which of the following elements is represented by a diatomic molecule in a chemical equation?

- A) beryllium B) boron **C) chlorine** D) krypton E) phosphorous

Use the answers on the right to answer Questions 3-7

3. In chemical equations the D appear on the left side of the equation.

4. Chemical equations represent a process in which one or more pure substances is C other pure substances.

5. Chemical equations are balanced by adding B to the equations.

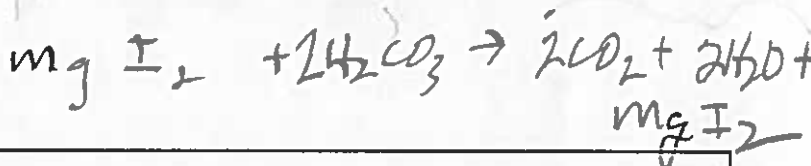
6. In chemical reactions atoms are neither A nor destroyed they only change partners.

7. When the product of a reaction is a precipitate the subscript CD is used in the formula.

- A) Created
B) Coefficients
C) Converted into
D) Reactant(s)
E) Product(s)
AB) Chemical bond
~~AD) Coefficients~~
AE) (g)
BC) (l)
CD) (s)

Complete and balance this double replacement reaction.

(6 pt) $\text{Mg}(\text{HCO}_3)_2(\text{aq})$ + 1 $\text{HI}(\text{aq}) \rightarrow$



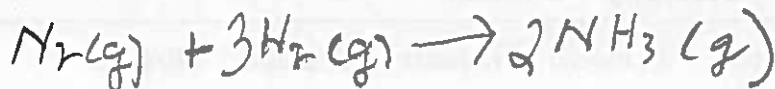
Answers for Questions #8-10

- A) Double displacement B) Single displacement C) Combination reaction D) Decomposition reaction E) Combustion

8. Type D (3 pt) Balance: 2 $\text{HgO}(\text{s}) \rightarrow$ 2 Hg + 1 O_2

9. Type B (4 pt) Balance: 1 $\text{Cu}(\text{s})$ + 2 $\text{AgNO}_3(\text{aq}) \rightarrow$ 2 $\text{Ag}(\text{s})$ + 1 $\text{Cu}(\text{NO}_3)_2(\text{aq})$

10. Type C (5 pt) Write & balance: Nitrogen gas and hydrogen gas react together to make ammonia gas.



(7 pt) Write the balanced equation for the combustion of acetylene (C_2H_2).



avg 86.78
med 85.25

11. Which of the following is considered a greenhouse gas?

- A) H_2 B) N_2 C) O_2 **D) CO_2** E) H_2O

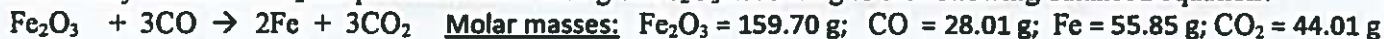
12. What is the molar mass of the compound, aluminum chloride?

- A) 26.98 amu B) 26.98 g C) 62.43 g D) 133.33 amu **E) 133.33 g**

13. For the reaction $2H_2 + O_2 \rightarrow 2H_2O$ how many moles of water is produced from 2.5 moles of hydrogen?

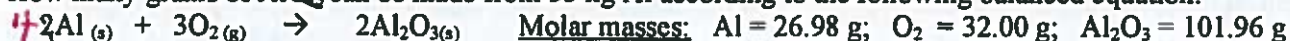
- a. 2.5 moles** b. 2.0 moles c. 18.0 grams d. 2.5 grams

14. How many moles of CO_2 are produced from 79.8 g of Fe_2O_3 according to the following balanced equation?



- A) 2.56 mol CO_2 B) 1.36 mole CO_2 **C) 1.50 mole CO_2** D) 1.14 mole CO_2 E) 1.62 mol CO_2

(8 pt) How many grams of $AlCl_3$ can be made from 55 kg Al according to the following balanced equation:



$$55 \text{ kg Al} \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mol Al}}{26.98 \text{ g}} \times \frac{2 \text{ mol } Al_2O_3}{4 \text{ mol Al}} \times \frac{101.96 \text{ g } Al_2O_3}{1 \text{ mol}} = 1.04 \times 10^5 \text{ g}$$

round 2 s.f. \rightarrow

$$1.0 \times 10^5 \text{ g } Al_2O_3$$

Chp 6 (Acids, Bases, Salts)

15. What kind of taste do acids have?

- A) sweet **B) sour** C) fruity D) slippery E) salty

Use these answers for questions 16-18: A) acid(s) B) base(s) C) neutral D) acidic E) basic

16. A are compounds that donate a H^+ in water.

17. Ammonia is a weaker B than sodium hydroxide

18. HCl is the A found in our stomachs.

Use these answers for Questions 19-20. Mark two answers on your scantron for each question.

- A) strong B) weak C) acid D) base

19. NaOH is a A D.

20. H_2CO_3 is a B C.

(22 pt) Fill in the correct name or the correct formula for the compounds listed in the following table.

COMPOUND FORMULA	ION FORMULA	ION FORMULA	COMPOUND NAME
$\text{Ca}(\text{NO}_3)_2$	Ca^{2+}	NO_3^-	calcium nitrate
KClO_3	K^+	ClO_3^-	potassium chlorate
SnCO_3	Sn^{2+}	CO_3^{2-}	tin (II) carbonate
KMnO_4	K^+	MnO_4^-	potassium permanganate
FeSO_3	Fe^{2+}	SO_3^{2-}	iron (II) sulfite
$(\text{NH}_4)_2\text{SO}_4$	NH_4^+	SO_4^{2-}	ammonium sulfate
CO_2	-----	-----	carbon dioxide
H_3PO_4	H^+	PO_4^{3-}	Phosphoric acid
HClO	H^+	ClO^-	hypochlorous acid

22 pt

PERIODIC CHART OF THE ELEMENTS

1 H 1.00797																	2 He 4.0026				
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 24.312															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 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	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 118.69	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)										

Numbers in parenthesis are mass numbers of most stable or most common isotope.

Atomic weights corrected to conform to the 1963 values of the Commission on Atomic Weights.

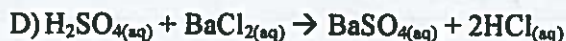
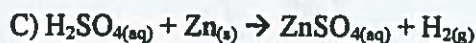
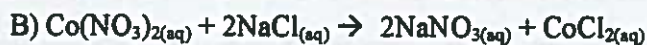
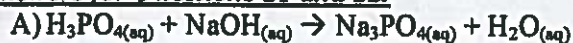
The group designations used here are the former Chemical Abstract Service numbers.

* 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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Answers for Questions 21 and 22.21. Which of the reactions is an acid base neutralization reaction? **A**22. Which of the reactions produces an acid? **D**Use these answers for questions 23-27

A) aqueous

B) electrolyte

C) neutral

D) acidic

E) basic

23. In **C** solutions the pH is equal to 7.24. A solution of pH 8 is more **E** than a solution of pH 5.25. In **D** solutions the pH is less than 726. In **D** solutions $[\text{OH}^-]$ is less than $[\text{H}_3\text{O}^+]$.27. A solution that contains $[\text{H}_3\text{O}^+] = 1.2 \times 10^{-8}$ is **E**.

Use the following equations for Questions 28 and 29.

$\text{pH} = -\log[\text{H}_3\text{O}^+] \text{ and } [\text{H}_3\text{O}^+] = 10^{-\text{pH}}$

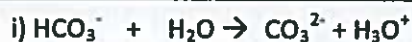
28. What is the pH of a solution that has a $[\text{H}_3\text{O}^+] = 1.2 \times 10^{-3}$?

A) 1.20

B) 2.92

C) 11.08

D) 12.80

29. What is the $[\text{H}_3\text{O}^+]$ concentration in a solution that has a $\text{pH} = 2.34$?**A) 2.3×10^{-3} M****B) 4.6×10^{-3} M**C) 2.2×10^{-12} MD) 1.2×10^1 MFor Questions 30 - 32 consider the following reactions for HCO_3^- 30. In equation i), HCO_3^- is a(an) **A) Acid** B) Base C) both D) neither31. In equation ii), HCO_3^- is a(an) A) Acid **B) Base** C) both D) neither32. Substances like HCO_3^- are known as A) amphiphatic **B) amphoteric** C) esoteric D) hyperbaric33. Buffers are substances that are A) solids B) liquids C) aqueous **D) resist pH changes in aqueous solutions.**