Chemistry Challenge Practice Exam #2

Multiple Choice

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

 1.	How many atoms are in 0.075 mol of titanium	?	
	a. 1.2×10^{-25}	c.	6.4×10^{2}
	b. 2.2×10^{24}	d.	4.5×10^{22}
 2.	How many molecules are in 2.10 mol CO_2 ?		
	a. 2.53×10^{24} molecules	c.	3.49×10^{-24} molecules
	b. 3.79×10^{24} molecules	d.	1.26×10^{24} molecules
 3.	What is the percent by mass of carbon in aceto	one, C	C ₃ H ₆ O?
	a. 20.7%	c.	1.61%
	b. 62.1%	d.	30.0%
 4.	What is the molar mass of AuCl ₃ ?		
	a. 96 g	c.	232.5 g
	b. 130 g	d.	303.6 g
 5.	What is the name of the ionic compound form	ed fr	om lithium and bromine?
	a. lithium bromine	с.	lithium bromium
	b. lithium bromide	d.	lithium bromate
 6.	What is the electron configuration of the galliu	ım io	n?
	a. $1s^2 2s^2 2p^6 3s^2 3p^6$	c.	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^6$
	b. $1s^2 2s^2 2p^6 3s^2 3p^5 4s^1$	d.	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10}$
 7.	What is the formula unit of sodium nitride?		
	a. NaN	c.	Na ₃ N
	b. Na ₂ N	d.	NaN ₃
8.	Which elements can form diatomic molecules	ioine	ed by a single covalent bond?
 	a. hydrogen only	5	,

- b. halogens only
- c. halogens and members of the oxygen group onlyd. hydrogen and the halogens only

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 9.	How are conditions of pressure and temperatura. by a line separating the phasesb. by the endpoints of the line segment separc. by the planar regions between lines in thed. by the triple points	e, at ating diag	which one phase exists shown on a phase diagram? g the phases ram
10.	How many valence electrons does a helium ato	m ha	ave?
	a. 2	c.	4
	b. 3	d.	5
 11.	How many valence electrons are in a silicon at	om?	
	a. 2	c.	6
	b. 4	d.	8
 12.	In which of the following sets is the symbol of electrons given correctly?	the e	element, the number of protons, and the number of
	a. In, 49 protons, 49 electrons	c.	Cs, 55 protons, 132.9 electrons
	b. Zn, 30 protons, 60 electrons	d.	F, 19 protons, 19 electrons
 13.	How many protons, electrons, and neutrons do contain?	es an	a atom with atomic number 50 and mass number 125
	a. 50 protons, 50 electrons, 75 neutrons	c.	120 neutrons, 50 protons, 75 electrons
	b. 75 electrons, 50 protons, 50 neutrons	d.	70 neutrons, 75 protons, 50 electrons
 14.	Hydrogen gas can be produced by reacting alun needed to completely react with 15.0 mol of all $2Al(s) + 3H_2SO_4(aq) \rightarrow Al_2(SO_4)_3(aq) + 3H_2SO_4(aq)$	minu umin 2(g)	nm with sulfuric acid. How many moles of sulfuric acid are num?
	a. 0.100 mol	c.	15.0 mol
	b. 10.0 mol	d.	22.5 mol
 15.	How many liters of hydrogen gas are needed to	o rea	ct with CS_2 to produce 2.50 L of CH_4 at STP?
	$4\mathrm{H}_{2}(g) + \mathrm{CS}_{2}(l) \to \mathrm{CH}_{4}(g) + 2\mathrm{H}_{2}\mathrm{S}(g)$		
	a. 2.50 L	c.	7.50 L
	b. 5.00 L	d.	10.0 L
 16.	If you rewrite the following word equation as a symbol for fluorine be?	ı bala	anced chemical equation, what will the coefficient and
	nitrogen trifluoride \rightarrow nitrogen + fluorine		
	a. $6F_2$	c.	6F
	b. F ₃	d.	3F ₂
 17.	In every balanced chemical equation, each side	of t	he equation has the same number of
	a. atoms of each element	С. Л	moles
	D. molecules	a.	coentcients

18. What are the missing coefficients for the skeleton equation below? $Al_2(SO_4)_3(aq) + KOH(aq) \rightarrow Al(OH)_3(aq) + K_2SO_4(aq)$ a. 1, 3, 2, 3 c. 4, 6, 2, 3 b. 2, 12, 4, 6 d. 1, 6, 2, 3 19. How does the energy of an electron change when the electron moves closer to the nucleus? c. It stays the same. It decreases. a. b. It increases. d. It doubles. 20. Which element, when combined with fluorine, would most likely form an ionic compound? a. lithium c. phosphorus carbon b. d. chlorine 21. Which of the following is a binary molecular compound? a. BeHCO₃ c. AgI b. PCl₅ d. MgS 22. What element has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^2$? c. silicon a. nitrogen d. silver b. selenium Which of the following factors contributes to the decrease in ionization energy within a group in the periodic 23. table as the atomic number increases? increase in atomic size a. b. increase in size of the nucleus c. increase in number of protons d. fewer electrons in the highest occupied energy level 24. Of the following elements, which one has the smallest first ionization energy? boron a. c. aluminum b. carbon d. silicon 25. To what category of elements does an element belong if it is a poor conductor of electricity? a. transition elements c. nonmetals metalloids metals b. d. 26. How does atomic radius change from top to bottom in a group in the periodic table? It first increases, then decreases. a. It tends to decrease. c. b. It tends to increase. d. It first decreases, then increases. 27. What is the number of chloride ions (Cl-) in 250 mL of a 0.2M magnesium chloride solution? c. 0.62 mol 0.1 mol a. 0.16 mol d. 1.6 mol b.

 28.	What mass of sucrose, $C_{12}H_{22}O_{11}$, is needed to make 500.0 mL of a 0.200 <i>M</i> solution?
	a. 34.2 gc. 17.1 gb. 100 gd. 68.4 g
 29.	The volume of 6.00M HCl needed to make 319 mL of 6.80M HCl is a. 0.128 mL c. 281 mL b. 7.8 mL d. 362 mL
 30.	What is the best description for a solution with a hydroxide-ion concentration of $1 \times 10^{-4} M$?a. acidicc. neutralb. basicd. The answer cannot be determined.
 31.	Which of the following compounds is an electrolyte?a. rubbing alcoholc. carbon tetrachlorideb. sugard. sodium hydroxide
 32.	Why does a higher concentration make a reaction faster?a. There are more collisions per second only.b. Collisions occur with greater energy only.c. There are more collisions per second and the collisions are of greater energy.d. There are more collisions per second or the collisions are of greater energy.
 33.	What is the measurement 1042 L rounded off to two significant digits?a. 1.0×10^3 Lc. 1050 Lb. 1040 Ld. 1.1×10^3 L
 34.	Express the sum of 1111 km and 222 km using the correct number of significant digits. a. 1300 km b. 1330 km c. 1333 km d. 1333.0 km
 35.	A gas occupies a volume of 2.4 L at 14.1 kPa. What volume will the gas occupy at 84.6 kPa ⁴ a. 497 L c. 14 L b. 2.5 L d. 0.40 L
 36.	A molecule with a single and a double covalent bond isa. CO_2 c. H_2S b. O_3 d. CS_2
 37.	What volume, in liters, of 0.40 M NaCl solution contains 0.10 moles of NaCla. 0.040c. 0.25b. 0.10d. 0.40

Chemistry Challenge Practice Exam #2 Answer Section

MULTIPLE CHOICE

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