SAT Chemistry Practice- Paper 38

1. What is the K_{sp} for silver acetate if a saturated solution contains 2×10^{-3} moles of silver ion/liter of solution?

A. 2×10^{-3}
B. 2×10^{-6}
C. 4×10^{-3}
D. 4×10^{-6}
E. 4×10^{6}

2. The following data were obtained for H_2O and H_2S:

	Formula	*Freezing*	*Boiling*
	Mass	*Point (°C)*	*Point (°C)*
H_2O	18	0	100
H_2S	34	-83	-60

What is the best explanation for the variation of physical properties between these two compounds?

A. The H_2S has stronger bonds between molecules.
B. The H_2O has a great deal of hydrogen bonding.
C. The bond angles differ by about 15°.
D. The formula mass is of prime importance.
E. The oxygen atom has a smaller radius and thus cannot bump into other molecules as often as the sulfur.

3. What is the pOH of a solution that has 0.00001 mole of H_3O^+/liter of solution?

A. 2
B. 3
C. 4
D. 5
E. 9

4. How many grams of sulfur are present in 1 mole of H_2SO_4?

A. 2
B. 32
C. 49
D. 64
E. 98

5. What is the approximate mass, in grams, of 1 liter of nitrous oxide, N_2O, at STP?

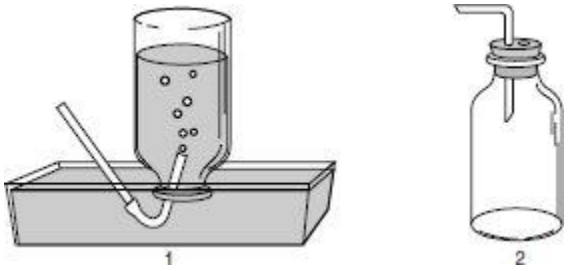
A. 1
B. 2
C. 11.2

D. 22
E. 44

6. If the simplest formula of a substance is CH_2 and its molecular mass is 56, what is its true formula?

A. CH_2
B. C_2H_4
C. C_3H_4
D. C_4H_8
E. C_5H_{10}

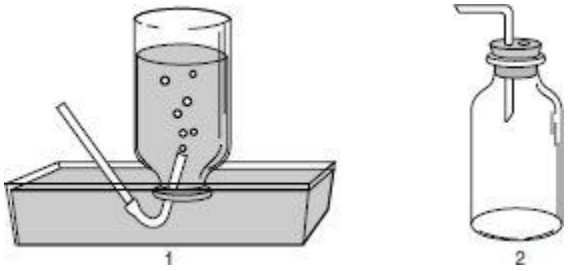
7. Question below refers to the following diagrams of two methods of collecting gases:



Method 1 is best suited to collect

A. a gas denser than air
B. a gas less dense than air
C. a gas that is insoluble in water
D. a gas that is soluble in water
E. a gas that has a distinct color

8. Question below refers to the following diagrams of two methods of collecting gases:



Which of these gases, because of its density and solubility, should be collected by Method 2?

A. NH_3
B. H_2
C. HCl
D. CO_2
E. He

9. What is the molar mass of $CaCO_3$?

A. 68 g/mol
B. 75 g/mol
C. 82 g/mol
D. 100 g/mol
E. 116 g/mol

10. What volume, in liters, will be occupied at STP by 4 grams of H_2?

A. 11.2
B. 22.4
C. 33.6
D. 44.8
E. 56.0

11. How many moles of KOH are needed to neutralize 196 grams of sulfuric acid? (H_2SO_4 = 98 amu)

A. 1.0
B. 1.5
C. 2.0
D. 4.0
E. 6.0

12. What volume, in liters, of $NH_3(g)$ is produced when 22.4 liters of $N_2(g)$ are made to combine completely with a sufficient quantity of $H_2(g)$ under appropriate conditions?

A. 11.2
B. 22.4
C. 44.8
D. 67.2
E. 89.6

13. What volume, in liters, of SO_2 will result from the complete burning of 64 grams of sulfur?

A. 2.00
B. 11.2
C. 44.8
D. 126
E. 158

14. The amount of energy required to melt 5.00 grams of ice at 0°C would also heat 1 gram of water at 4°C to what condition? (Heat of fusion = 80 cal/g or 3.34×10^2 J/g; heat of vaporization = 540 cal/g or 2.26×10^3 J/g)

A. water at 90°C
B. water at 100°C
C. steam at 100°C
D. Part of the water would be vaporized to steam.
E. All of the water would be vaporized to steam.

15. How many moles of electrons are needed to electroplate a deposit of 0.5 mole of silver from a silver nitrate solution?

A. 0.5
B. 1
C. 27
D. 54
E. 108

16. All of the following statements about carbon dioxide are true EXCEPT:

A. It can be prepared by the action of acid on $CaCO_3$.
B. It is used in fire extinguishers.
C. It dissolves slightly in water at room temperature.
D. It sublimes rather than melts at 20°C and 1 atm pressure.
E. It is a product of photosynthesis in plants.

17. Three moles of H_2 and 3 moles of I_2 are introduced into a liter box at a temperature of 490°C. What will the *K* expression be for this reaction? (*K* = 45.9)

A. $$K = \frac{[H_2][I_2]}{[HI]}$$

B. $$K = \frac{[HI]}{[H_2][I_2]}$$

C. $$K = \frac{2x}{(x)(x)}$$

D. $$K = \frac{(2x)^2}{(3-x)^2}$$

E. $$K = \frac{(3-x)^2}{(2x)^2}$$

18. If the following reaction has achieved equilibrium in a closed system:

$N_2O_4(g) \rightleftharpoons 2\ NO_2(g)$

which of the following is (are) increased by decreasing the size of the container?

I. The value of *K*

II. The concentration of $N_2O_4(g)$

III. The rate of the reverse reaction

A. I only
B. III only
C. I and II only

D. II and III only
E. I, II, and III

19. Which of the following correctly completes this nuclear reaction: $^{14}_{7}\mathrm{N} + {}^{4}_{2}\mathrm{He} \rightarrow \cdots + {}^{1}_{1}\mathrm{H}$?

A. $^{17}_{8}\mathrm{O}$
B. $^{16}_{9}\mathrm{O}$
C. $^{17}_{8}\mathrm{N}$
D. $^{17}_{7}\mathrm{N}$
E. $^{16}_{8}\mathrm{O}$

20. How many grams of NaCl will be needed to make 100. milliliters of 2 M solution?

A. 5.85
B. 11.7
C. 29.2
D. 58.5
E. 117

21. How many grams of H_2SO_4 are in 1,000. grams of a 10.% solution? (1 mol of H_2SO_4 = 98 g)

A. 1.0
B. 9.8
C. 10.
D. 98
E. 100.

22. If 1 mole of ethyl alcohol in 1,000 grams of water depresses the freezing point by 1.86° Celsius, what will be the freezing point of a solution of 1 mole of ethyl alcohol in 500 grams of water?

A. -0.93°C
B. -1.86°C
C. -2.79°C
D. -3.72°C
E. -5.58°C

23. Which nuclear reaction shows the release of a beta particle?

A. $^{235}_{92}\mathrm{U} + {}^{1}_{0}\mathrm{n} \rightarrow {}^{93}_{36}\mathrm{Kr} + {}^{140}_{56}\mathrm{Ba} + 3\ {}^{1}_{0}\mathrm{n}$
B. $^{210}_{84}\mathrm{Po} \rightarrow {}^{206}_{82}\mathrm{Pb} + {}^{4}_{2}\mathrm{He}$
C. $^{14}_{6}\mathrm{C} \rightarrow {}^{14}_{7}\mathrm{N} + {}^{0}_{-1}\mathrm{e}$
D. $^{106}_{47}\mathrm{Ag} + {}^{0}_{-1}\mathrm{e} \rightarrow {}^{106}_{46}\mathrm{Pd}$
E. $^{38}_{19}\mathrm{K} \rightarrow {}^{38}_{18}\mathrm{Ar} + {}^{0}_{+1}\mathrm{e}$

Question	Correct Answer
1	D
2	B
3	E
4	B
5	B
6	D
7	C
8	C
9	D
10	D
11	D
12	C
13	C
14	D
15	A
16	E
17	D
18	D
19	A
20	B
21	E
22	D
23	C