CHEMISTRY SAMPLE TEST 2

1. Which substances could be decomposed by chemical reactions?

   1. water 2. sugar 3. mercury 4. argon

   A: 1,2 B: 2,3 C: 3,4 D: 2,4 E: 1,3

2. What is the volume of 8.8 g CO_2 at STP? The molar mass of CO_2 is 44 g/mol.

   A: 22.4 L B: 2.24 L C: 44.8 L D: 4.48 L E: 0.20 L

3. Under the symbol of $2SO_3$ you may understand
   1. 2 moles of SO_3
   2. 2 molecules of SO_3
   3. 6 moles of O_2
   4. 2 x 6 x 10^{23} O atoms

   A: 1,2,4 B: 2,3 C: 3,4 D: 1,2,3 E: 1,2

4. A radioactive isotope has a half life of 10 days. What fraction of the original amount of the isotope remains after 30 days?

   A: 1/2 B: 1/3 C: 1/6 D: 1/8 E: 1/10

5. Which main energy shell can accommodate a maximum number of 8 electrons?

   A: 1 B: 2 C: 3 D: all of them E: none of them

6. An element has the electron configuration of $1s^2 2s^2 2p^6 3s^2 3p^2$. The number of valence electrons is

   A: 2 B: 4 C: 8 D: 12 E: 14

7. Which element - shown with its electron dot symbol - gives a compound with nitrate ion that has the formula of $X(NO_3)_2$?

   A:  B:  C:  D:  E: 

8. Magnesium forms an ion with a charge of
   A: 1+ by losing one electron.
   B: 1− by gaining one electron.
   C: 2+ by losing two electrons.
   D: 2− by gaining two electrons.
   E: 3+ by losing 3 electrons.

9. Which molecules contain polar covalent bonds?

1. CO_2 2. CCl_4 3. F_2 4. KF

A: 1,2 B: 2,4 C: 1,2,3 D: 2,3,4 E: 1,3,4

10. Ionic bond is likely to form between the atoms of

1. C and Br 2. Ca and I 3. P and Cl 4. O and Na

A: 1,2 B: 2,3 C: 2,4 D: 1,2,4 E: 3,4

11. Which of the following changes will shift the reaction at equilibrium to the left?

$$2\ H_2S(g) \rightleftharpoons 2\ H_2(g) + S_2(g) \quad \Delta H = +41\ kJ$$

1. Increase the concentration of H_2S.
2. Decrease the temperature.
3. Increase the pressure.
4. Increase the concentration of H_2.

A: 1,2 B: 1,2,3 C: 2,3,4 D: 1,2,3,4 E: 2,3

12. Which solution contains the largest amount of glucose?
A: 0.5 L of 2 M solution
B: 50 mL of 0.2 M solution
C: 1000 mL of 1 M solution
D: 0.25 L 5 M solution
E: 500 mL 0.5 M solution

13. Choose the solution with the highest hydronium ion concentration.
A: pH = 2 HBr solution
B: pH = 2 HNO_3 solution
C: 0.1 M HCl solution
D: 0.1 M CH_3COOH solution
E: 0.1 M H_3PO_4 solution

14. The oxidation number of Mn in MnO_4^- ion is

A: +1 B: +8 C: +5 D: −7 E: +7

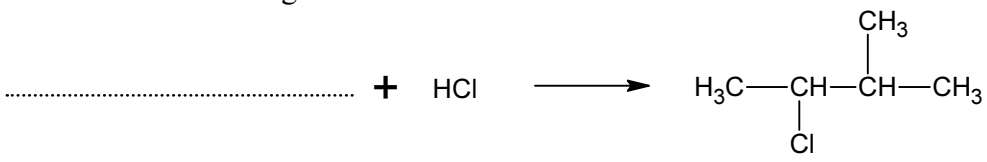
15. In the stomach the hydrochloric acid concentration is about 0.1 M. How many milliliters of the gastric fluid contain 0.5 g of HCl?
The molar mass of HCl is 36.5 g/mol.

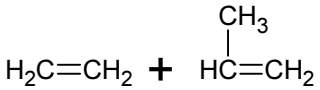
A: 36.5 mL B: 137 mL C: 0.011 mL D: 91.3 mL E: 1.8 mL

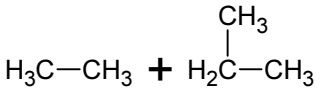
16. You need to prepare a sodium chloride solution with 10 % m/m concentration. If you start from 50 g of NaCl what is the mass of water needed to make the solution?

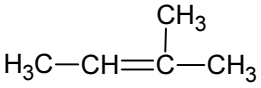
A: 450 g B: 500 g C: 60 g D: 5 g E: 0.85 g

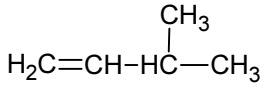
17. What is/are the missing reactant/s?

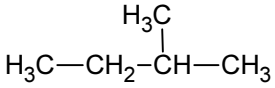


A: 

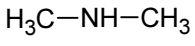
B: 

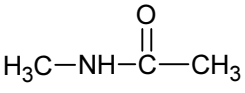
C: 

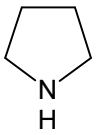
D: 

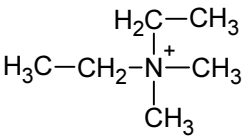
E: 

18. Which of the compounds below are amines?

1. 

2. 

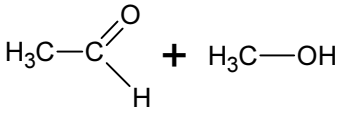
3. 

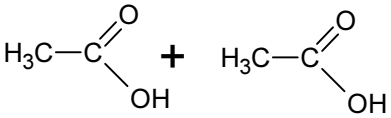
4. 

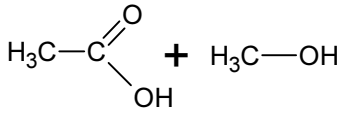
A: 1,2 B: 1,2,3 C: 2,3,4 D: 1,2,3,4 E: 1,3,4

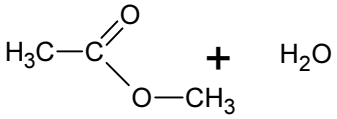
19. Which reactants produce an ester?

A: 

B: 

C: 

D: 

E: 

20. Which statement is *true* for disaccharides?
A: Cellulose is one of them.
B: Their solid phase has an ionic lattice structure.
C: They are well soluble in water.
D: They can be prepared from monosaccharides by hydrolysis.
E: They always contain an aldose and a ketose.