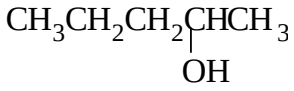
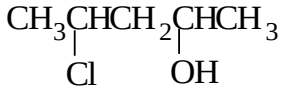
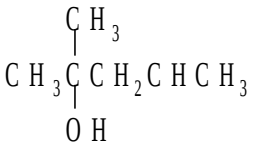
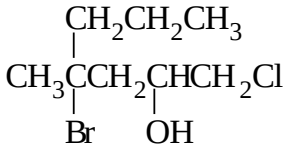
ALCOHOLS

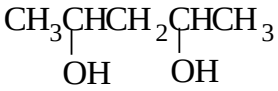
1. Name the following compounds.

A. 

B. 

C. 

D. 

E. 

F. $(CH_3CH_2)_3COH$

G. $CH_3CHClCH(CH_3)OH$

2. Draw structures for the following compounds.
A. 2-pentanol
B. 3-methyl, 2-butanol
C. cyclobutanol
D. 2-chloroethanol
E. isopropyl alcohol
F. 2,2-dimethyl pentanol
G. 3-chloro, 1-propanol
H. n-butyl alcohol
I. 2,3-butandiol

3. Write down the possible isomers of the alcohols that have the molecular formula, $C_5H_{11}OH$.

4. Write equations for the preparation of the following compounds. More than one step may be necessary.
A. Isopropyl alcohol from n-propyl bromide
B. Vinyl alcohol from vinyl chloride
C. n-butyl alcohol from butyl bromide
D. Ethyl alcohol from calcium carbide

5. Write equations for each of the followings (some may involve several steps)
A. n-propyl alcohol $\rightarrow$ propene
B. t-butyl alcohol to t-butyl bromide

6. Write equations for each of the following reactions:
A. t-butanol + hydrochloric acid $\rightarrow$
B. 1-pentanol + potassium metal $\rightarrow$
C. propene + water $\rightarrow$
D. 2-pentene + water $\rightarrow$

7. How many grams of ethanol, which is 92% pure, can be obtained from 160g of 80% pure calcium carbide?

8. Which alcohol and how many grams are produced by the hydration of 9.6 g of 2-butene?

9. How many liters of hydrogen gas at STP react with carbon monoxide to obtain 1.6 g of methyl alcohol?

10. A 20 g sample of an impure ethanol reacts with sodium metal to form 4.48 L of hydrogen gas at STP. What is the percentage concentration of the pure alcohol in the sample?

11. How many liters of carbon monoxide gas must be reacted with enough hydrogen to prepare 1.6g of methanol at STP?

12. When a 4kg sample of glucose is fermented, 1.84 kg of ethanol is obtained. What is the percentage purity of glucose by mass?

13. If a 22.4L mixture of CO and H_2 at STP is reacted, 8 g of methyl alcohol are obtained. What is the percentage by volume of hydrogen? Assume that all carbon monoxide is used up.

14. When a 12 g sample of alcohol is reacted with metallic sodium, 2.24 L of hydrogen at STP are liberated. What is the molecular weight of the alcohol?

15. How many liters of hydrogen gas are produced when 1050 g of 46% aqueous solution of ethanol is reacted with excess potassium metal?

16. When a 100g mixture of alcohol and water, each contributes equal moles, is reacted with metallic sodium, 44.8 L of hydrogen gas at STP are produced. What is the formula and name of the alcohol?

17. A 136 g mixture of methyl alcohol and water liberates 67.2 L hydrogen gas at STP when reacted with sodium. What is the mole percentage of alcohol in the mixture?

18. When a 20 g mixture of hexane and propyl alcohol is reacted with sodium, 3.36 L of hydrogen gas at STP are produced. What is the percentage by mass of hexane?

19. A monohydric alcohol contains 50 % oxygen when analyzed. What is the formula of the alcohol?

20. The molecular weight of a sodium alkoxide formed from a monohydric alcohol is 54 g. What is the molecular weight of alcohol?

21. When a 0.5 mol mixture of methanol and ethanol is burned completely, 16.8 L of CO_2 at STP are produced. What is the mole percentage of ethanol in the mixture?

22. If 0.1mol of methyl alcohol is reacted with enough formic acid, HCOOH, how many grams of ester is produced?

23. When 3.6 g of water are added to an alkene, 14.8 g of an alcohol is obtained. What is the name and molecular formula of the alcohol obtained?

24. What is the molecular formula of an alkene that can add 0.1 mol of water to produce 6 g of alcohol?

25. An organic compound of carbon, hydrogen and oxygen is found to consist of 38.7%C, 9.71%H and 51.6%O by mass. If the density of vapor of this compound at STP is 2.77 g/L, and it is an alcohol, what is the structural formula and name of the compound?

26. A 0.88 g sample of an alcohol yields 2.2 g CO_2 and 1.08 g H_2O, as a result of combustion analysis. What is the formula and name of the alcohol?

27. A 27.6 g sample of ethanol is oxidized by 800 mL alkaline potassium permanganate solution. What is the molarity of $KMnO_4$ solution?

28. Given two saturated monohydric alcohols in which the ratio of molecular weights of alcohols is 15/8, and the moles of alcohols are 1/2. If a 24.8 g sample of mixture is completely burned, 22.4 L of CO_2 are produced at STP. Write the formulas, and find the mass of each alcohol.

29. A mixture containing equal number of moles of glycol (1, 2-ethanediol) and glycerin (1, 2, 3-propanetriol) was treated with excess Na to give 5.6L of hydrogen gas at STP. What is the weight of the original mixture?

30. 15 g of a monohydric alcohol contains 4 g of oxygen. Find the molecular formula of the compound.