CHEMISTRY

BOOKS - MBD

ATOMS AND MOLECULES

Example

1. In a reaction ,5.3g of sodium carbonate reacted with 6g of ethanoic acid. The product were 2.2 g of carbon dioxide,0.9g water and

8.2g sodium ethanoate. Show that these observation are in agrement with the law of conservation of mass. Sodium carbonate + ethanoic acid $\rightarrow$ sodium ethanoate + carbon dioxde + water.

2. Hydrogen and oxygen combine in the ratio of $1:8$ by mass to from water. What mass of oxygen gas would be required to react completely with 3g of hydrogen?

3. Which postulate of Dalton's atomic theory is the result of the law of coservation of mass?

4. Which postulate of Dalton's atomic theory can explain the law of define proportion?

5. Define the atomic mass unit?

6. Why is not possible to see an atom with naked eyes?

7. Write down the formula of sodium oxide

8. Write down the formula of Aluminium chloride

9. Write down the formula of sodium sulphide

10. Write down the formula of Magnesium hydroxide

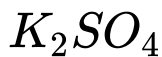**11.** Write down the name of the compounds represented by the following formualae.
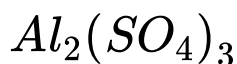
$$Al_2(SO_4)_3$$

12. Write down the name of the compounds represented by the following formualae.

$$CaCl_2$$

13. Write down the name of the compounds represented by the following formualae.

K_2SO_4

14. Write down the name of the compounds represented by the following formualae.

KNO_3

15. Write down the name of the compounds represented by the following formualae. $CaCO_3$

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16. What is meant by the term chemical formula?

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17. How many atoms are present in, H_2S molecule

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18. How many atoms are present in, PO_4^{3-} ion?

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19. Calculate the molecular masses of $H_2, O_2, Cl_2, CO_2, CH_4, C_2H_4, NH_3, CH_3OH$.

20. Calculate the formmula unit mass of ZnO, Na_2O, K_2CO_3.

21. If one mole of carbon atom weigh 12 grams. What is the mass (in grams) of 1 atom of carbon?

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22. Which has more number of atoms, 100 gram of sodium or 100 gram of iron (given atomic mass of Na= 23 u, Fe=56u)?

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23. A 0.24 g of coumpound of oxgen and boron was found by analysis to contain 0.096 g of born and 0.144g of oxygen. Calculate the percentage composition of the compound by weight.

24. When 3.0 g of carbon is burnt in 8.00 g oxygen, 11.00 g of carbon dioxide is produced. What mass of carbon dioxide will be formed when 3.00 g of carbon is burnt in 50.00 g of

oxygen ? Which law of chemical combination will govern your answer ?

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25. What are polyatomic ions ? Give examples.

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26. Write the chemical formula of the following :Magnesium chloride

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27. Write the chemical formula of the following

:Calcium oxide

28. Write the chemical formula of the

following :Copper nitrate

29. Write the chemical formula of the following :Aluminium chloride

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30. Write the chemical formula of the following :Calcium carbonate

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31. Give the names of the elements present in the following compounds :Quick lime

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32. Give the names of the elements present in the following compounds :Hydrogen bromide

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33. Give the names of the elements present in the following compounds : Baking powder

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34. .Give the names of the elements present in the following compounds :Potassium sulphate

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35. Calculate the molar mass of the following substances : Ethyne C_2H_2

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36. Calculate the molar mass of the following substances :Sulphur moleule, S_8

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37. Calculate the molar mass of the following substances :Phosphorus molecule, P_4 (Atomic mass of phosphorus is 31)

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38. Calculate the molar mass of the following substances :Hydrochloric acid, HCl

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39. Calculate the molar mass of the following substances : Nitiric acid,HNO_3.

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40. What is the mass of : 1 mole of nitrogen atoms ?

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41. What is the mass of :) 4 moles of aluminium atoms (Atomic mass of aluminium = 27) ?

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42. What is the mass of : 10 moles of sodium sulphite (Na_2SO_3)?

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43. Convert into moles : 12g of oxygen gas

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44. Convert into moles : 20g of water

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45. Convert into moles : 22g of carbon dioxide

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46. What is the mass of : 0.2 mole of oxyen atoms?

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47. What is the mass of: 0.5 mole of water molecules?

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48. Calculate the number of molecules of sulphur (S_8) present in 16g of solid sulphur.

49. Calculate the number of aluminium ions present in 0.051 g of aluminium oxide

50. Write the important postulates of the Dalton's Atomic Theory

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51. Give four drawbacks of Dalton's Atomic Theory

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52. How will you write the name of a binary molecular compound ?

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53. Give one experiment to prove the truth of law of conservation of mass.

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54. Differentiate between an atom and a

molecule.

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55. What do you understand by the term

chemical formula ?

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56. What qualitative information is given by the formula NH_3

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57. Write down the formula of :Aluminium oxide

▶ Watch Video Solution

58. Write down the formula of :Aluminium chloride

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59. Write down the formula of : Hydrogen sulphide

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60. Calculate the relative molecular masses of :

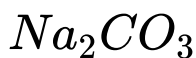Water (H_2O)

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61. Calculate the relative molecular masses of :

Nitric acid (HNO_3)

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62. Write down the names of the compounds represented by the following formula:
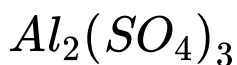
Na_2CO_3

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63. Write down the names of the compounds represented by the following formula: $MgCl_2$

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64. Write down the names of the compounds represented by the following formula:

$Al_2(SO_4)_3$

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65. Write down the names of the compounds represented by the following formula : K_2SO_4

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66. Write down the names of the compounds represented by the following formula: $NiSO_4$

67. Write down the names of the compounds represented by the following formula: KNO_3

68. Write down the names of the compounds represented by the following formula : $CaCO_3$

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69. Work out the formula of :) Ammonia

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70. Work out the formula of :Carbon dioxide

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71. Work out the formula of : carbon tetrachloride

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72. Calculate the number of moles in : `52g of He

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73. Calculate the number of moles in :

12.044×10^{23}

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74. Give one example in each case , Diatomic

molecule

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75. Give one example in each case , Triatomic molecule

76. Give one example in each case , Monoatomic molecule

77. An element A has a charge of 3+. Write down the formula of its :Choride

78. An element A has a charge of 3+. Write down the formula of its : Sulphate

79. An element A has a charge of 3+. Write down the formula of its :Nitrate

80. An element A has a charge of 3+. Write down the formula of its : Phoshphate

81. Write the formula and names of the compounds between : Sodium and sulphate ions

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82. Write the formula and names of the compounds between : Aluminium and chloride ions

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83. Write the formula of the compounds formed by : Cr^{3+} and F^-

84. Write the formula of the compounds formed by : Pb^{2+} and SO_4^{2-}

85. Write the formula of the compounds formed by : Mg^{2+} and S^{2-}

86. Write the formula of the compounds formed by: NH_4^+ and $Cr_2O_7^{2-}$

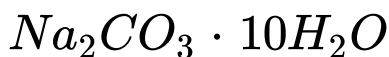**87.** Write the formula of the compounds formed by : $k+$ and CrO_4^{2-}

88. Calculate the formula mass of:

$Na_2CO_3 \cdot 10H_2O$

89. What do you understand by trivial names of compounds ?

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90. Give the chemical names of five such compounds and give their trivial names.

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91. Calculate :The number of atoms,in 46 g of

Na

92. An element X shows two valencies i.e. 2 and

4. Write the formula of its oxides.

93. Write the formula of the following salts :Zinc carbonate

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94. Write the formula of the following salts : Ammonium sulphate

▶ **Watch Video Solution**

95. Write the formula of the following salts :Barium chloride

▶ **Watch Video Solution**

96. Write the formula of the following salts :Sodium nitrate

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97. Write the formula of the following salts :Lead hydroxide

98. Write the formula of the following salts : Potassium permanganate

99. Write the names of the following compounds : $Al_2(SO_4)_3$

100. Write the names of the following compounds : $Mg(HCO_3)_2$

101. Write the names of the following compounds : $(NH_4)_2S$

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102. Write the names of the following compounds : $KMnO_4$

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103. Write the names of the following compounds : $KClO_3$

104. Weight of copper oxide obtained by treating 2.16 g metallic copper with nitric acid and subsequent ignition was 2.70 g. In another experiment, 1.15 g of copper oxide on reduction yielded 0.92 g of copper. Show that

these results illustrate the law of definite proportions.

105. In water molecule the ratio by mass in which hydrogen and oxygen react is 1 : 8, Calculate the ratio by number of atoms in water molecules.

106. Calculate the formula masses of the compounds whose formula are given below :

MgO

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107. Calculate the formula masses of the compounds whose formula are given below :

$CaCl_2$

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108. Calculate the formula masses of the compounds whose formula are given below :

$CaCO_3$

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109. What is the weight of 0.1 mole of HCl ?

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110. What is the mass of 0.1 mole of CO_2 in g ?

111. Calculate the number of moles of phosphorus atoms (P) in 100 g of phosphorus (Atomic mass of P = 31)

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112. How many grams of oxygen gas contain the same number of molecules as are present in 16 grams of sulphur dioxide ? (Atomic masses : S = 32, O = 16).

113. What is the mass in grams of each of the following : 1.0 mole of Ag.(atomic mass: Ag=108).

114. What is the mass in grams of each of the following : 0.5 mole of Mg.(atomic mass: Mg =24).

115. What is the mass in grams of each of the following $: 6.023 \times 10^{23}$ atom of P? (atomic mass: P=31).

116. Calculate the number of oxygen atoms in 0.10 mole of $Na_2CO_3 \cdot 10H_2O$.

117. Calculate the actual weight of : an atom of

oxygen

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118. Calculate the actual weight of : a molecule

of NH_3

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119. Find the number of molecules in 1.8 g of H_2O.

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120. Which of the following would weigh most ? 1 Mole of H_2O,1 mole of CO_2,1 mole of NH_3, 1 mole of CO.

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121. Calculate the number of moles of phosphorus atoms in 100 g of phosphorus. If phosphorus is considered to contain P_4 molecules, then how many moles it has ?

122. Find the number of hydrogen atoms in 0.1 mole of H_2SO_3.

123. Calculate the number of atoms in each of the following :52 mole of He

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124. Calculate the number of atoms in each of the following : 52 mole of He

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125. Calculate the number of atoms in each of the following : 52 mole of He

126. When did Indian philosophers thought of division of matter ?

127. What was the view of Maharishi Kanad regarding the division of matter ?

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128. What was the name of smallest indivisible particle by Kanad ?

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129. Which two Greek philosophers considered smallest particle as indivisible ?

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130. What is the ratio by mass of H and O in water ?

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131. What is the ratio by mass of N and H in

NH_3

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132. What is Prouÿs law of constant

composition ?

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133. Who gave Atomic theory ?

134. When did John Dalton gave atomic theory

?

135. What are the units used to express the

atomic radius ?

136. What is the relationship between m and nm ?

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137. What is the building block of all matter ?

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138. Who was the first scientist which used symbols for elements ?

139. What was special about symbols of elements given by Berzelius ?

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140. What were the units used for expressing atomic masses of elements initially ?

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141. When was C^{12} isotope universally accepted as standard reference for expressed atomic masses ?

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142. Which unit is used now-a-days to express atomic masses ?

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143. Name the smallest particle of an element or compound which can exist freely ?

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144. What is obtained when the atoms of the same element combine ?

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145. How many atoms are present in oxygen molecule.

▶ **Watch Video Solution**

146. Give four examples of diatomic molecules.

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147. Give one example of tetra-atomic molecule.

148. Give one example of octa-atomic molecule.

149. What is produced when three atoms of oxygen combine.

150. Name isotopes of carbon

151. What is the ratio by mass of C and O in carbon dioxide ?

152. What is the ratio by number between the atoms of H and O in water ?

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153. Define an ion.

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154. What is a cation ?

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155. What is an anion ?

156. What is the ratio by mass of Ca nd O in calcium oxide (CaO) ?

157. What is the ratio by mass of Mg and S in magnesium sulphate ?

158. What is the ratio by mass of Na and Cl in sodium chloride (NaCl) ?

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159. Define chemical formula ?

  ▶ **Watch Video Solution**

160. Define valency

  ▶ **Watch Video Solution**

161. What are diatomic molecules ?

 ▶ **Watch Video Solution**

162. Define molecular mass of a subtance?

 ▶ **Watch Video Solution**

163. Which unit is used for expressing molecular masses ?

164. What is the new name given to a.m.u. by IUPAC ?

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165. Name the elements present in wate(H_2O)

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166. What is one mole of an element ?

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167. What is Avogardro's number ?

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168. How is Avogadro's number denoted ?

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169. In what ratio elements combine to form a compound ?

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170. Which scientist gave law of conservation of mass ?

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171. Which scientist gave law of constant composition ?

172. What does a.m.u. represent ?

173. Which isotope of carbon is used as a standard reference to express atomic masses ?

174. Most of the elements have fractional atomic masses,What does it show ?

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175. What is molar mass ?

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176. Define gram atomic mass.

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177. How many atoms are present in 1 gram atom of an element ?

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178. Do 1 mole of sodium and calcium have different number of atoms ?

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179. Lead nitrate solution and sodium chloride solution taken in separate beakers. The beakers were weighed and mixed in one beaker and the beaker was weighed again. Does weight remains unchanged or not ? On what principle, the answer is based upon ?

180. 28 g of magnesium oxide is produced by the combination of 12 g of magnesium and 16

g of oxygen. Which law is illustrated by this data ?

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181. Do 1 mole of Na and O_2 have same mass?

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182. 1 mole represents particles........

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183. The molar mass of NH_3 is ....

184. An element Z has valency of 3. Write down the formula of its oxide?

185. How many atoms are present in 0.012 kg of C^{12}- isotope ? What is this number called?

186. Write down the formula of compound made up of Al^{3+} and SO_4^{2-}

187. How many molecules are present in 9g of water ?

188. What is the molecular mass of HNO_3. (Atomic masses, H=1u,N=14u,O=16u)

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189. How many valence electrons are in chlorine atom.

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190. What are polyatomic ions ?.

191. The molecular formula of aluminium sulphate is ....