



CHEMISTRY

BOOKS - NAND LAL PUBLICATION

ATOMS AND MOLECULES

Intext Questions

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

8.2g sodium ethanoate. Show that these observations are in agreement with the law of conservation of mass. Sodium carbonate + ethanoic acid \rightarrow sodium ethanoate + carbon dioxide + water.



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



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



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



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5. Define the atomic mass unit?



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



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7. Write down the formula of sodium oxide



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8. Write down the formula of :Aluminium chloride



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9. Write down the formula of sodium sulphide



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10. Write down the formula of Magnesium hydroxide



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11. Write down the names of compound represented by the following formulae :

(i) $Al_2(SO_4)_3$ (ii) $CaCl_2$ (iii) K_2SO_4

(iv) KNO_3 (v) $CaCO_3$



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12. What is meant by the term chemical formula?





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13. How many atoms are present in a H_2S molecule



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



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



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16. Calculate the molecular masses of O_2



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17. Calculate the molecular masses of

H_2 , O_2 , Cl_2 , CO_2 , CH_4 , C_2H_4 , NH_3 , CH_3OH



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



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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



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20. Calculate the molecular masses of C_2H_6



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



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



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



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24. Calculate the formula unit masses of ZnO , Na_2O , K_2CO_3 , given atomic masses of Zn = 65 u , Na = 23 u , K = 39 u , C = 12 u , and O = 16 u



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



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26. 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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Exercises

1. A 0.24 g of compound of oxygen 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.



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2. 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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3. What are polyatomic ions ? Give examples.



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4. Write the formula of magnesium chloride .

Also name the elements presents in them.



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5. Write the chemical formula of the following

:Calcium oxide



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6. Write the chemical formula of the following

:Copper nitrate



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7. Write down the formula of Aluminium chloride



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8. Write the formula of calcium carbonate .
Also name the elements presents in them.



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9. Give the names of the elements present in the following compounds

(a) Quick lime (b) Hydrogen bromide

(c) Baking powder (d) Potassium sulphate



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



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11. Calculate the molar mass of the following substances :Sulphur molecule, S_8



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



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



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



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



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



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



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18. Convert into moles : 12g of oxygen gas



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19. Convert into moles : 20g of water



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20. Convert into moles : 22g of carbon dioxide



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21. What is the mass of : 0.2 mole of oxygen atoms?



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



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



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



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Additional Questions Very Short Answer Type Questions

1. In which year was the idea of divisibility of matter considered in India ?



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2. Which philosophers had always wondered about the unknown and unseen form of matter ?



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3. Name two Indian philosophers who studied about the particles of matter



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4. What name was given to the smallest articles of matter by Maharishi Kanad ?



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5. During which century did the scientists recognize the difference between elements and compounds ?



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1. What name was given to the smallest articles of matter by Maharishi Kanad ?



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2. What was the Indian philosopher , Pakudha Katyayama's contribution to Maharishi Kanad's postulate ?



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3. What was the suggestion given by the Greek philosophers Democritus and Leucippus regarding matter ?



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4. Define

Molecule



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Additional Questions Long Answer Type Questions

1. Write the rules for writing symbols . Give an example of each rule .



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