The World of Chemistry

Episode 11 - The Mole

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1. Why is it important to use the correct amount of materials in a chemical reaction7

2. What names are given to the materials at the beginning and end of a chemical reaction?

3. Atoms and molecules are extremely small. How do chemists "count" them? Can you think of an everyday application of this?

4. a. What did early chemists discover about reactions involving the combination of gases?

   b. How did Avogadro explain this?

5. How may a chemical equation such as $H_2 + Cl_2 \longrightarrow 2\ HCl$ be interpreted?

6. What is true about the mass of a compound?

7. What is the numerical value for Avogadro's Number?

8. When the I V solutions were prepared, quality control was involved. What is quality control?

9. Why did using twice as much magnesium not produce twice as much hydrogen in the demonstration?

10. What ratio of starting materials was found to produce the best epoxy resin?

Answer Key

1. Why is it important to use the correct amount of materials in a chemical reaction?

   If too little is used the reaction may not proceed very far. The use of too much chemical may result in waste.

2. What names are given to the materials at the beginning and end of a chemical reaction?

   Reactants and products.

3. Atoms and molecules are extremely small. How do chemists "count" them? Can you think of an everyday application of this?

   They weigh them. If you know the number of nails or screws in a given mass, it is quicker to weigh them instead of counting them individually.

4. a. What did early chemists discover about reactions involving the combination of gases?

   They combined in small whole number ratios.

   b. How did Avogadro explain this?

   Equal volumes of gases under the same conditions) contain equal numbers of particles.

5. How may a chemical equation such as $H_2 + Cl_2 \longrightarrow 2\ HCl$ be interpreted?

   *It may be interpreted at the **molecular** basis or in terms of **moles**.*

6. What is true about the mass of a compound?

   It is equal to the sum of the masses of the individual atoms in the compound.

7. What is the numerical value for Avogadro's Number? *6.02×10^{23}*

8. When the I V solutions were prepared, quality control was involved. What is quality control?

   The testing of a manufactured product to determine if it contains what it is supposed to contain.

9. Why did using twice as much magnesium not produce twice as much hydrogen in the demonstration?

   The hydrochloric acid was used up. The magnesium will be totally consumed only if twice as many moles of acid are present. The hydrochloric acid became the limiting reagent.

10. What ratio of starting materials was found to produce the best epoxy resin?

    A one - to - one ratio.