Particle Models of Chemical Change

New Regents original practice • Name: _____ Date: _____
Show your work for written answers.

In a particle drawing, joined circles represent atoms bonded in one molecule. An atom's label stays the same during an ordinary chemical reaction.

1 A drawing shows three separate O_2 molecules. How many O atoms are shown?

(1) 2

(2) 3

(3) 5

(4) 6

2 Explain the difference between $2H_2$ and H_4 when reading a particle model. [1]

Answer and work

_____

_____

3 What must be conserved in a closed chemical-reaction drawing?

(1) The number of molecules of every substance

(2) The number of atoms of each element

(3) The number of single bonds

(4) The distance between every pair of atoms

4 A before panel shows two O atoms and an after panel shows three. Explain why they cannot both show all particles in the same closed reaction. [1]

Answer and work

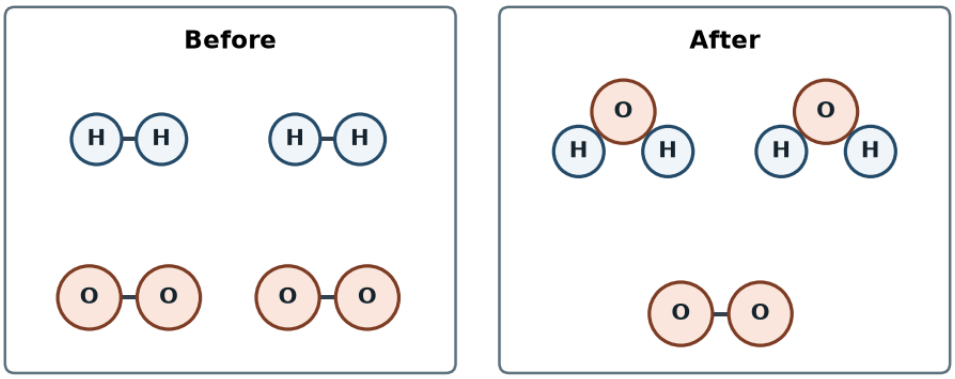
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Before and After a Model Reaction

Use the information below to answer the questions.

The diagram represents a closed model reaction of hydrogen and oxygen. Connected atoms belong to the same molecule. Read each panel as a count of particles.



Particle counts before and after the model reaction.

5 How many H_2O molecules form in the after panel?

(1) 1

(2) 2

(3) 3

(4) 4

6 Count the H and O atoms in the before panel and in the after panel. Show whether the counts agree. [1]

Answer and work

7 Which molecule remains unchanged in the after panel?

(1) H_2

(2) O_2

(3) H_2O

(4) All reactant molecules are used.

8 Write a balanced equation for the molecules that react and the molecules they form. Use the diagram to explain how you treated the leftover O_2. [1]

Answer and work