# Particle Model and Balancing Equations Pre Quiz /28

Multiple Choice- 4 marks each /20

1. Which of the following chemical equations is balanced correctly?
   A)   5 HI   + HIO_3 →   3 H_2O +   3 I_2
   B)   HI   + 6 HIO_3 →   3 H_2O + I_2
   C)   HI   + HIO_3 → H_2O + I_2
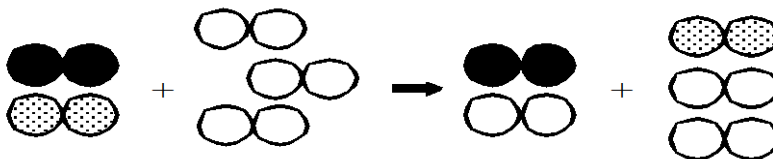   D)   6 HI   + HIO_3 →   3 H_2O +   3 I_2

2. Galena is an ore that contains lead sulfide (PbS). To extract lead from galena, the ore is first heated in the presence of dioxygen (O_2). The balanced equation of this reaction is :

$$2 \text{ PbS} + 3 \text{ O}_2 \rightarrow 2 \text{ PbO} + 2 \text{ SO}_2$$
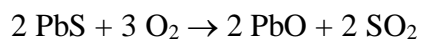
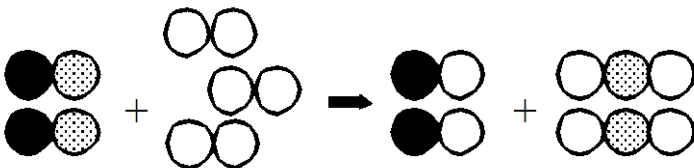Which of the models below represents this reaction?
   lead :⬤ sulfur : ⊙   oxygen : ◯

A)

B)

C)
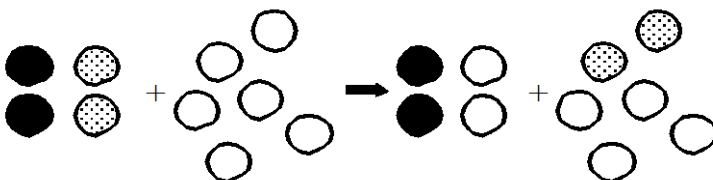
D)

3. Which of the following chemical equations is correctly balanced?
   A) CH_4 + O_2 → CO_2 +   2 H_2O
   B) 2 Na   + H_2O →   2 NaOH   + H_2
   C) V_2O_5 +   5 CaS   →   5 CaO   + V_2S_5
   D) NaBr   + $Pb(ClO_4)_2$ → $NaClO_4$ + $PbBr_2$

4. The following is the unbalanced equation for a chemical reaction involving iron (Fe) and water (H_2O):

$$Fe + H_2O \rightarrow Fe_2O_3 + H_2$$

In its reduced form, what is the coefficient of hydrogen in the balanced equation form?
A) 3   B) 6   C) 2   D) 1

5. When 12.5 g of calcium carbonate ($CaCO_3$) reacts with a certain amount of sodium chloride (NaCl), 13.9 g of calcium chloride ($CaCl_2$) and 13.2 g of sodium carbonate (Na_2CO_3) are produced.
The balanced equation for this reaction is as follows:

$$CaCO_{3(aq)} + 2\,NaCl_{(aq)} \rightarrow CaCl_{2(aq)} + Na_2CO_{3(s)}$$

What is the mass of the sodium chloride (NaCl) involved in this reaction?
A) 7.3 g   B) 14.6 g   C) 27.1 g   D) 29.2 g

Short Answer /8

6. Four unbalanced chemical equations are given below. Balance these equations by including the coefficients so that the equations are in their simplest form. /4

a) $Mg_{(s)} + O_{2(g)} \rightarrow MgO_{(s)}$

b) $NaOH_{(aq)} + H_3PO_{4(aq)} \rightarrow Na_3PO_{4(aq)} + H_2O_{(l)}$

c) $Fe + Cl_2 \rightarrow FeCl_3$

d) $FeS_2 + O_2 \rightarrow Fe_2O_3 + SO_2$

7. Ammonia gas, NH_3, is used extensively in industry. It is prepared according to the following chemical equation:

$$N_{2(g)} + 3\,H_{2(g)} \rightarrow 2\,NH_{3(g)}$$

Ammonium nitrates, NH_4NO_3, is an organic compound used in agriculture and is prepared using NH_3 gas and nitric acid, HNO_3, as follows:

$$NH_{3(g)} + HNO_{3(aq)} \rightarrow NH_4NO_{3(aq)}$$

In an industrial process, 28 kg of nitrogen gas, N_2, reacts with 6 kg of hydrogen gas. H_2, to produce NH_3. This amount of NH_3, is then reacted with 126 kg of HNO_3 to produce NH_4NO_3. What was the mass of NH_4NO_3? /4