SNC2DI

Balancing Practice Problems - ANSWERS

Count the total number of each kind of "reactant atom" and total number of each type of "product atom" to balance the following equations. Record the numbers in the spaces provided.

1. _**2**_$H_{2\,(g)}$ + ____$O_{2(g)}$ → _**2**_$H_2O_{(g)}$

Rocket fuel is burned in a shuttle main engine.

Reactants		Products	
Element	#	Element	#
H	**4**	H	**4**
O	**2**	O	**2**

2. ____$CH_{4(g)}$ + _**2**_$O_{2(g)}$ → ____$CO_{2(g)}$ + _**2**__$H_2O_{(g)}$

Natural gas is burned in a gas furnace in many homes.

Reactants		Products	
Element	#	Element	#
C	**1**	C	**1**
H	**4**	H	**4**
O	**4**	O	**4**

3. _**2**__ $Fe_2O_{3\,(s)}$ + _**6**_ $Cl_{2(g)}$ → _**4**__$FeCl_{3\,(s)}$ + _**3**__ $O_{2(g)}$

Reactants		Products	
Element	#	Element	#
Fe	**4**	Fe	**4**
Cl	**12**	Cl	**12**
O	**6**	O	**6**

4. _**4**_ $NH_{3(g)}$ + _**3**__$O_{2(g)}$ → _**2**_$N_{2(g)}$ + _**6**_$H_2O_{(g)}$

Ammonia will burn slowly in pure oxygen.

Reactants		Products	
Element	#	Element	#
N	**4**	N	**4**
H	**12**	H	**12**
O	**6**	O	**6**

5. ____$CS_{2(l)}$ + _**3**_$Cl_{2(g)}$ → ____$CCl_{4(l)}$ + ____ $S_2Cl_{2(g)}$

How carbon tetrachloride (banned cleaning fluid) used to be made.

Reactants		Products	
Element	#	Element	#
C	**1**	C	**1**
S	**2**	S	**2**
Cl	**6**	Cl	**6**

6. ____$N_{2(g)}$ + _**3**_$H_{2(g)}$ → _**2**__$NH_{3(g)}$

How ammonia is made.

Reactants		Products	
Element	#	Element	#
N	**2**	N	**2**
H	**6**	H	**6**

7. _**2**__$Al_{(s)}$ + _**3**_ $H_2SO_{4\,(aq)}$ → _**3**__ $H_{2(g)}$ + ____$Al_2(SO_4)_{3(aq)}$

Note: If the complex ion does not break up then balance the number of complex ions on each side of the chemical equation.

Reactants		Products	
Element	#	Element	#
Al	**2**	Al	**2**
H	**6**	H	**6**
SO_4	**3**	SO_4	**3**

8. __**2**_$H_2O_{2(l)}$ → _**2**__$H_2O_{(l)}$ + ____$O_{2(g)}$

Hydrogen peroxide decomposes when put on a cut.

Reactants		Products	
Element	#	Element	#
H	**4**	H	**4**
O	**4**	O	**4**

EXTRA TOUGH!!! See if you can get it!!

9. _**16**_$H_2S_{(g)}$ + _**8**_$SO_{2(g)}$ → +_**16**__$H_2O_{(g)}$ + _**3**_$S_{8(s)}$

Sour gas can be reacted with sulphur dioxide to deposit sulphur which can be stored.

Reactants		Products	
Element	#	Element	#
H	**16**	H	**16**
S	**24**	S	**24**
O	**16**	O	**16**

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Balancing Practice Activity

Part A – *Balance the following equations and then write the word equation for each in the space provided.*

_2_ Al + **_3_** Br_2 → **_2_** $AlBr_3$

Aluminum plus bromine yields aluminum bromide

___ KI + ___ $Pb(NO_3)_2$ → ___ KNO_3 + ___ PbI_2

Potassium iodide plus lead(II)nitrate yields potassium nitrate plus lead(II)iodide

___ C_3H_8 + **_5_** O_2 → **_4_** H_2O + **_3_** CO_2

Tricarbon octahydride plus oxygen gas yields dihydrogen monoxide plus carbon dioxide

_2_ Al_2O_3 → **_4_** Al + **_3_** O_2

Aluminum oxide yields aluminum plus oxygen gas

Part B – *Write the chemical equations for the following word equations and then balance them. Make sure to include states if they are known*

Solid iron plus oxygen gas makes solid iron (III) oxide.

$$4\ Fe_{(s)} + 3\ O_{2(g)} \rightarrow 2\ Fe_2O_{3(s)}$$

Aqueous barium chloride and aqueous magnesium sulphate yields solid barium sulphate and aqueous magnesium chloride.

$$BaCl_{2(aq)} + MgSO_{4(aq)} \rightarrow BaSO_{4(s)} + MgCl_{2(aq)}$$

When heated, solid potassium chlorate produces potassium chloride gas and oxygen gas.

$$2\ KClO_{3(s)} \rightarrow 2\ KCl_{(g)} + 3\ O_{2(g)}$$

Aqueous lithium sulphate reacts with aqueous beryllium carbonate to produce aqueous lithium carbonate and solid beryllium sulphate.

$$Li_2SO_{4(aq)} + BeCO_{3(aq)} \rightarrow Li_2CO_{3(aq)} + BeSO_{4(s)}$$