Key

Balancing Chemical Equations Worksheet

Balance the following reactions by filling in the coefficients.

1. ___ $C(s)$ + 2 $H_2(g)$ → ___ $CH_4(g)$

C	H	C	H
1	~~2~~ 4	1	4

2. ~~2~~4 $Fe(s)$ + 3 $O_2(g)$ → 2 Fe_2O_3

Fe	O	Fe	O
~~2~~4	2 6	2 4	~~3~~ 6

3. 2 $NaI(s)$ → 2 $Na(s)$ + ___ $I_2(s)$

Na	I	Na	I
2	2	2	2

4. ___ $C_6H_{12}O_6(s)$ → 6 $C(s)$ + 6 $H_2O(l)$

C	H	O	C	H	O
6	12	6	6	12	~~6~~ 6

5. 2 $AgNO_3(aq)$ + ___ $Cu(s)$ → 2 $Ag(s)$ + ___ $Cu(NO_3)_2(aq)$

Ag	N	O	Cu	Ag	N	O	Cu
2	2	6	1	2	2	6	1

6. ___ $Na_2CO_3(aq)$ + 2 $HCl(aq)$ → 2 $NaCl(aq)$ + ___ $H_2O(l)$ + ___ $CO_2(g)$

Na	C	O	H	Cl	Na	C	O	H	Cl
2	1	3	1	1	~~2~~ 2	1	3	2	~~2~~ 2

7. ___ $H_2(g)$ + ___ $Cl_2(g)$ → 2 $HCl(g)$

H	Cl	H	Cl
2	2	1	1

8. ___ $N_2(g)$ + 2 $O_2(g)$ → ___ $N_2O_4(g)$

N	O	N	O
2	~~3~~ 4	2	4

9. ___ $CH_4(g)$ + 2 $O_2(g)$ → ___ $CO_2(g)$ + 2 $H_2O(g)$

C	H	O	C	H	O
1	4	~~2~~ 4	1	~~4~~ 2	~~3~~ 4

10. ___ $N_2(g)$ + 3 $H_2(g)$ → 2 $NH_3(g)$

N	H	N	H
2	~~3~~ 6	~~1~~ 2	3 6

11. 2 H_2O_2 (l) → 2 H_2O (l) + ___ O_2 (g)

H	O
24	24

H	O
24	34

12. 2 Al_2O_3 → 4 Al (s) + 3 O_2 (g)

Al	O
4	36

Al	O
4	26

13. ___ C (g) + ___ O_2 (g) → ___ CO_2 (g)

C	O
1	2

C	O
1	2

14. 2 CuO (s) + ___ C (s) → 2 Cu (s) + ___ CO_2 (g)

Cu	O	C
2	2	1

Cu	O	C
2	2	1

15. ___ $Ca(OH)_2$ (aq) + 2 HCl (aq) → ___ $CaCl_2$ (aq) + 2 H_2O (l)

Ca	O	H	Cl
1	2	34	≠2

Ca	O	H	Cl
1	2≠	24	2

Regents Practice

16. Which equation shows a conservation of mass?
    a. $Na + Cl_2 \rightarrow NaCl$ ✗
    b. $Al + Br_2 \rightarrow AlBr_3$ ✗
    c. $H_2O \rightarrow H_2 + O_2$ ✗
    d. $PCl_5 \rightarrow PCl_3 + Cl_2$

17. All chemical reactions have a conservation of
    a. Mass, only
    b. mass and charge, only
    c. charge and energy, only
    d. mass, charge, and energy

18. Given the unbalanced equation: ___ Fe_2O_3 + 3 CO → 2 Fe + 3 CO_2
    When the equation is correctly balanced using the *smallest* whole-number coefficients, what is the coefficient of CO?
    a. 1 b. 2 c. 3 d. 4

19. Consider the following unbalanced equation: 2 Ag + 1 H_2S → 1 Ag_2S + 1 H_2
    What is the *sum* of the coefficients when the equation is balanced using the smallest whole-number coefficients?
    a. 5 b. 8 c. 10 d. 4
    2+1+1+1

20. Given the unbalanced equation: ___ $Mg(ClO_3)_2$ (s) → ___ $MgCl_2$ (s) + 3 O_2 (g)
    What is the coefficient of O_2 when the equation is balanced using the smallest whole-number coefficients?
    a. 1 b. 2 c. 3 d. 4