Excellent!

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Chemistry *~ Ms. Hart* **Class:** Anions or Cations

THE URBAN ASSEMBLY SCHOOL FOR CRIMINAL JUSTICE

6.5 Balancing Equations

Directions: balance each of the equations below. Use a sheet of loose leaf if you need more space.

1. 2 Sb + 3 Cl_2 → 2 $SbCl_3$	18. 2 NaBr + 1 Cl_2 → 2 NaCl + 1 Br_2
2. 2 Mg + 1 O_2 → 2 MgO	19. 1 Zn + 2 $AgNO_3$ → 1 $Zn(NO_3)_2$ + 2 Ag
3. 1 $CaCl_2$ → 1 Ca + 1 Cl_2	20. 1 Sn + 2 Cl_2 → 1 $SnCl_4$
4. 2 $NaClO_3$ → 2 NaCl + 3 O_2	21. 1 $Ba(OH)_2$ → 1 BaO + 1 H_2O
5. 1 Fe + 2 HCl → 1 $FeCl_2$ + 1 H_2	22. ~~2~~ 1 $Mg(OH)_2$ + ~~4~~ 2 HCl → ~~2~~ 1 $MgCl_2$ + ~~4~~ 2 H_2O simplify: 1 $Mg(OH)_2$ + 2 HCl → 1 $MgCl_2$ + 2 H_2O
6. 1 CuO + 1 H_2 → 1 Cu + 1 H_2O	23. 1 Na_2CO_3 + 2 HCl → 2 NaCl + 1 H_2CO_3
7. 2 Al + 3 H_2SO_4 → 1 $Al_2(SO_4)_3$ + 3 H_2	24. 1 NH_4NO_2 → 1 N_2 + 2 H_2O
8. 1 $MgBr_2$ + 1 Cl_2 → 1 $MgCl_2$ + 1 Br_2	25. 2 N_2 + 5 O_2 → 2 N_2O_5

9. 1 SnO_2 + 2 C → 1 Sn + 2 CO	26. 1 $MgCO_3$ → 1 MgO + 1 CO_2
10. 1 $Pb(NO_3)_2$ + 1 H_2S → 1 PbS + 2 HNO_3	27. 2 KBr + 1 Cl_2 → 2 KCl + 1 Br_2
11. 2 HgO → 2 Hg + 1 O_2	28. 1 Zn + 1 $CuSO_4$ → 1 Cu + 1 $ZnSO_4$
12. 2 $KClO_3$ → 2 KCl + 3 O_2	29. 4 P + 3 O_2 → 1 P_4O_6 simplifiq → 2P + 3O2 → 1P4O6
13. 1 N_2 + 3 H_2 → 2 NH_3	30. 1 $SrBr_2$+ 1 $(NH_4)_2CO_3$→ 1 $SrCO_3$ + 2 NH_4B1
14. 2 $AgNO_3$+ 1 $(NH_4)_2CrO_4$→ 1 Ag_2CrO_4+ 2 NH_4NO_3 2 2 1	31. 4 Li + 1 O_2 → 2 Li_2O simplifiq → 2Li + 1O2 → 1Li2O
15. ~~4~~ 2 K + ~~4~~ 2 H_2O → ~~4~~ 2 KOH + ~~2~~ 1 H_2 simplifiq → 2K + 2H2O → 2KOH + 2H2	32. 1 $ZnCl_2$ + 2 KOH → 1 $Zn(OH)_2$ + 2 KCl
16. 2 Al + 3 $Pb(NO_3)_2$ → 2 $Al(NO_3)_3$ + 3 Pb	33. 1 Fe_3O_4 + 4 H_2 → 3 Fe + 4 H_2O simplifiq → 1Fe3O4 + 2H2 → 3Fe + 2H2O
17. 3 Fe + 2 O_2 → 1 Fe_3O_4	34. 1 $Pb(NO_3)_2$ → 1 Pb + 2 NO_2 + 1 O_2

6.5 Balancing Equations

1. $Sb + Cl_2 \rightarrow SbCl_3$

$\underline{2}\ Sb + \underline{3}\ Cl_2 \rightarrow \underline{2}\ SbCl_3$

Sb	1	1
Cl	2	3

Sb	2	2
Cl	6	6

2. $Mg + O_2 \rightarrow MgO$

$\underline{2}\ Mg + \underline{\ }\ O_2 \rightarrow \underline{2}\ MgO$

Mg	1	1
O	2	1

Mg	2	2
O	2	2

3. $CaCl_2 \rightarrow Ca + Cl_2$

$\underline{1}\ CaCl_2 \rightarrow \underline{1}\ Ca + \underline{1}\ Cl_2$

Ca	1	1
Cl	2	2

4. $NaClO_3 \rightarrow NaCl + O_2$

$\underline{2}\ NaClO_3 \rightarrow \underline{2}\ NaCl + \underline{3}\ O_2$

Na	1	1
Cl	1	1
O	3	2

Na	2	2
Cl	2	2
O	6	6

5. $Fe + HCl \rightarrow FeCl_2 + H_2$

Fe	1	1
H	1	2
Cl	1	2

$\_Fe + \_2HCl \rightarrow \_FeCl_2 + \_H_2$

Fe	1	1
H	2	2
Cl	2	2

6. $CuO + H_2 \rightarrow Cu + H_2O$

Cu	1	1
O	1	1
H	2	2

7. $Al + H_2SO_4 \rightarrow Al_2(SO_4)_3 + H_2$

$\_2Al + \_3H_2SO_4 \rightarrow \_Al_2(SO_4)_3 + \_3H_2$

Al	1	2
H	2	2
SO_4	1	3

Al	2	2
H	6	6
SO_4	3	3

8. $MgBr_2 + Cl_2 \rightarrow MgCl_2 + Br_2$

Mg	1	1
Br	2	2
Cl	2	2

9. $SnO_2 + C \rightarrow Sn + CO$

Sn	1	1
O	2	1
C	1	1

$\_1SnO_2 + \_2C \rightarrow \_1Sn + \_2CO$

Sn	1	1
O	2	2
C	2	2

10. $Pb(NO_3)_2 + H_2O \rightarrow PbO + HNO_3$

$\underline{1}\ Pb(NO_3)_2 + \underline{1}\ H_2O \rightarrow \underline{1}\ PbO + \underline{2}\ HNO_3$

Pb	1	1
NO_3	2	1
H	2	1
O	1	1

Pb	1	1
NO_3	2	2
H	2	2
O	1	1

11. $HgO \rightarrow Hg + O_2$

$\underline{2}\ HgO \rightarrow \underline{2}\ Hg + \underline{\ }\ O_2$

Hg	1	1
O	1	2

Hg	2	2
O	2	2

12. $KClO_3 \rightarrow KCl + O_2$

$\underline{2}\ KClO_3 \rightarrow \underline{2}\ KCl + \underline{3}\ O_2$

K	1	1
Cl	1	1
O	3	2

K	2	2
Cl	2	2
O	6	6

13. $N_2 + H_2 \rightarrow NH_3$

$\underline{1}\ N_2 + \underline{3}\ H_2 \rightarrow \underline{2}\ NH_3$

N	2	1
H	2	3

N	2	2
H	6	6

14. $AgNO_3 + (NH_4)_2CrO_4 \rightarrow Ag_2CrO_4 + NH_4NO_3$

$\underline{2}\ AgNO_3 + \underline{1}\ (NH_4)_2CrO_4 \rightarrow \underline{1}\ Ag_2CrO_4 + \underline{2}\ NH_4NO_3$

Ag	1	2
NO_3	1	1
NH_4	2	1
CrO_4	1	1

Ag	2	2
NO_3	2	2
NH_4	2	2
CrO_4	1	1

15. $K + H_2O \rightarrow KOH + H_2$

$\underline{4}\ K + \underline{4}\ H_2O \rightarrow \underline{4}\ KOH + \underline{2}\ H_2$

K	1	1
H	2	3
O	1	1

K	4	4
H	8	8
O	4	4

16. $Al + Pb(NO_3)_2 \rightarrow Al(NO_3)_3 + Pb$

$\underline{2}\ Al + \underline{3}\ Pb(NO_3)_2 \rightarrow \underline{2}\ Al(NO_3)_3 + \underline{3}\ Pb$

Al	1	1
Pb	1	1
NO_3	2	3

Al	2	2
Pb	3	3
NO_3	6	6

17. $Fe + O_2 \rightarrow Fe_3O_4$

$\underline{3}\ Fe + \underline{2}\ O_2 \rightarrow \underline{1}\ Fe_3O_4$

Fe	1	3
O	2	4

Fe	3	3
O	4	4

18. $NaBr + Cl_2 \rightarrow NaCl + Br_2$

$\underline{2}\ NaBr + \underline{1}\ Cl_2 \rightarrow \underline{2}\ NaCl + \underline{1}\ Br_2$

Na	1	1
Br	1	2
Cl	2	1

Na	2	2
Br	2	2
Cl	2	2

19. $Zn + AgNO_3 \rightarrow Zn(NO_3)_2 + Ag$

$\underline{1}\ Zn + \underline{2}\ AgNO_3 \rightarrow \underline{1}\ Zn(NO_3)_2 + \underline{2}\ Ag$

Zn	1	1
Ag	1	1
NO_3	1	2

Zn	1	1
Ag	2	2
NO_3	2	2

20. $Sn + Cl_2 \rightarrow SnCl_4$

Sn	1	1
Cl	2	4

$\underline{1}\ Sn + \underline{2}\ Cl_2 \rightarrow \underline{1}\ SnCl_4$

Sn	1	1
Cl	4	4

21. $Ba(OH)_2 \rightarrow BaO + H_2O$

Ba	1	1
O	2	~~1~~ 2
H	2	~~1~~ 2

$\_\_\ Ba(OH)_2 \rightarrow \_\_\ BaO + \_\ H_2O$

Ba		
O		
H		

22. $Mg(OH)_2 + HCl \rightarrow MgCl_2 + H_2O$

Mg	1	1
Cl	1	2
O	2	1
H	~~2~~ 3	2

$\underline{2}\ Mg(OH)_2 + \underline{4}\ HCl \rightarrow \underline{2}\ MgCl_2 + \underline{4}\ H_2O$

4H > 0+1
4 0

Mg	~~3~~ 2	2
O	4	~~3~~ 4
H	3 0	~~3~~ 7 8
Cl	4	4

23. $Na_2\boxed{CO_3} + HCl \rightarrow NaCl + H_2\boxed{CO_3}$

Na	2	1
CO_3	1	1
H	1	2
Cl	1	1

$\underline{1}\ Na_2CO_3 + \underline{2}\ HCl \rightarrow \underline{2}\ NaCl + \underline{1}\ H_2CO_3$

Na	2	2
CO_3	1	1
H	2	2
Cl	2	2

24. $NH_4NO_2 \rightarrow N_2 + H_2O$

$\underline{1}\ NH_4NO_2 \rightarrow \underline{1}\ N_2 + \underline{2}\ H_2O$

N	~~1~~ 2	2
H	4	2
O	2	1

N	2	2
H	4	4
O	2	2

25. $N_2 + O_2 \rightarrow N_2O_5$

$2N_2 + 5O_2 \rightarrow 2N_2O_5$

N	2	2
O	2	5

N	4	4
O	10	10

26. $MgCO_3 \rightarrow MgO + CO_2$

$1MgCO_3 \rightarrow 1MgO + 1CO_2$

Mg	1	1
C	1	1
O	3	3

27. $KBr + Cl_2 \rightarrow KCl + Br_2$

$2KBr + 1Cl_2 \rightarrow 2KCl + 1Br_2$

K	1	1
Br	1	2
Cl	2	1

K	2	2
Br	2	2
Cl	2	2

20. $Zn + CuSO_4 \rightarrow Cu + ZnSO_4$

Zn	1	1
Cu	1	1
SO_4	1	1

29. $P + O_2 \rightarrow P_4O_6$

$4P + 3O_2 \rightarrow 1P_4O_6$

P	1	4
O	2	6

P	4	4
O	6	6

30. $Sr\,Br_2 + \boxed{(NH_4)_2}\boxed{CO_3} \rightarrow Sr\boxed{CO_3} + \boxed{NH_4}\,Br$

Sr	1	1
Br	2	1
NH_4	2	1
CO_3	1	1

$1\,Sr\,Br_2 + 1\,(NH_4)_2CO_3 \rightarrow 1\,Sr\,CO_3 + 2\,NH_4Br$

Sr	1	1
Br	2	2
NH_4	2	2
CO_3	1	1

31. $Li + O_2 \rightarrow Li_2O$

$4\,Li + 1\,O_2 \rightarrow 2\,Li_2O$

Li	1	2
O	2	1

Li	4	4
O	2	2

32. $ZnCl_2 + \boxed{KOH} \rightarrow Zn\boxed{(OH)_2} + KCl$

Zn	1	1
Cl	2	1
K	1	1
OH	1	2

$1\,ZnCl_2 + 2\,KOH \rightarrow 1\,Zn(OH)_2 + 2\,KCl$

Zn	1	1
Cl	2	2
K	2	2
OH	2	2

33. $Fe_3O_4 + H_2 \rightarrow Fe + H_2O$

$1\,Fe_3O_4 + 4\,H_2 \rightarrow 3\,Fe + 4\,H_2O$

Fe	3	1
O	4	1
H	2	2

Fe	3	3
O	4	4
H	8	8

$Pb(NO_3)_2 \rightarrow Pb + NO_2 + O_2$

34. ~~$Pb(NO_3)_2 \rightarrow Pb + NO_2 + O_2$~~

Pb	1	1
N	2	1
O	6	4

$1 Pb(NO_3)_2 \rightarrow 1 Pb + 2 NO_2 + 1 O_2$

Pb	1	1
N	2	2
O	6	6