Noteset 5C – In Class Notes

Balancing w/ Polyatomic Ions

Polyatomic Ions = 1 atom in balancing

$A NO_3$ NO_3^{1-} = 1 atom $A(NO_3)_2$ NO_3^{1-} = 2 atoms

Single Replacement

3 "SO_4" not 12 "SO"!

$2\ Al + 3\ CuSO_4 \rightarrow 3\ Cu + Al_2(SO_4)_3$

Al- 1	Al- 2	Al- ~~1~~ 2	Al- 2
Cu- ~~1~~ 3	Cu- 1	Cu- 3	Cu- ~~1~~ 3
SO_4- ~~1~~ 3	SO_4^{-3}	SO_4-3	SO_4^{-3}
$(\frac{3}{1}=3)$			

Balance SO_4^{2-} First

Balance Al and Cu

Polyatomic Ions are balanced "whole"

$3 \cdot ASO_4$ = 3A and $3\ SO_4^{2-}$

Double Replacement

$2 \cdot ClO_3 = 2ClO_3$

$2\,Fe(ClO_3)_2 + \_\_\_\,Zn_2CO_3 \rightarrow \_\_\_\,FeCO_3 + 2\,ZnClO_3$

Fe - 1	Fe - 1	Fe - 1	Fe - 1
ClO_3 - 2	ClO_3 - ~~1~~ 2	ClO_3 - 2	ClO_3 - 2
Zn - 2	Zn - ~~1~~ 2	Zn - 2	Zn - 2
CO_3 - 1	CO_3 - 1	CO_3 - 1	CO_3 - 1

Balance ClO_3 first — Eqn. Balanced

$2\,Al_2(CrO_4)_3 + 3\,Pb(BrO_3)_4 \rightarrow 4\,Al(BrO_3)_3 + 3\,Pb(CrO_4)_2$

Al: 2	Al: ~~1~~ 4	Al: ~~2~~ 4 $(\frac{8}{2}=2)$	Al: 4
CrO_4: 3	CrO_4: 2	CrO_4: ~~3~~ 6	CrO_4: ~~2~~ 6
Pb: ~~1~~ 3	Pb: 1	Pb: 3	Pb: ~~1~~ 3
BrO_4: ~~4~~ 12	BrO_4: ~~3~~ 12	BrO_4: 12	BrO_4: 12

Balance BrO_4 — $(BrO_4: \frac{12}{4}=3)$ $(BrO_4: \frac{12}{3}=4)$

Balance Al, Balance CrO_4 — $(\frac{4}{2}=2)$ $(\frac{6}{2}=3)$