

Chemical Reaction Balancing Ratio Chart

Atom Ratio	1:1	2:2	1:2	1:3	1:4	1:6	2:4	2:3	4:3	2:6	3:6
Coefficients	1-1	1-1	2-1	3-1	4-1	6-1	2-1	3-2	3-4	3-1	2-1
Atom Ratio	3:3	4:4	2:1	3:1	4:1	6:1	4:2	3:2	3:4	6:2	6:3
Coefficients	1-1	1-1	1-2	1-3	1-4	1-6	1-2	2-3	4-3	1-3	1-2

Complete the following reactions based on the in class notes and presentations.

Combo Rxn
B=N
N₂ | B

Reaction	Fe + N ₂ → Fe = +2				Reaction	Ti + Na ₂ CO ₃ → + Ti = +4				
A + B → AB					A + BC → AC + B					
A	Fe	B	N		A	Ti	BC	Na ₂ CO ₃	B	Na

Na₂CO₃ | B | C

Formula	A	B (SA)
Ion Charge	+2	-3
Cross Method	Fe	N
AB	Fe ₃ N ₂	

Formula	A	C (Poly)
Ion Charge	+4	-2
Cross Method	Ti	(CO ₃)
AC	Ti(CO ₃) ₂ *	

*Reduce
Ti₂(CO₃)₄ / 2

Check for diatomic element (see chart!)

Reaction	MnF ₃ → +				
AB → A + B					
AB	MnF ₃	A	Mn	B	F ₂

Mn | F₃
A | B
Mn F₂
Diatomic

Diatomic Elements
H ₂ , N ₂ , O ₂ F ₂ , Cl ₂ , Br ₂ , I ₂

Always check for diatomic w/ decomp

Check! → Diatomic

Balance the following chemical reactions. Show complete balancing chart include cross outs

Steps
① Make chart (count atoms)
② show cross off
③ add coefficients

2 Cr + 3 F ₂ → 2 CrF ₃				
Reactants		Products		
Cr	2	Cr	2	
F	6	F	6	

① 2:3
F 3-2
② 1:2
2-1

3 Ru + _____ W(PO ₄) ₂ → _____ W + _____ Ru ₃ (PO ₄) ₂				
Reactants		Products		
Ru	3	Ru	3	
W	1	W	1	
PO ₄	2	PO ₄	2	

① 1:3
Ru 3-1

For the following reactions, write the products of each reaction following the template provided. Balance each reaction. Show work for ionic compound and cross out for balancing.

Reaction	$2 \text{V} + 3 \text{Zn}_2\text{SO}_4 \rightarrow \text{V}_2(\text{SO}_4)_3 + 6 \text{Zn}$ <p style="text-align: center;">V = +3 Zn = +1</p>			
General Form	$\text{A} + \text{BC} \rightarrow \text{AC} + \text{B}$			

Formula	A	C (poly)	Reactants		Products	
Ion Charge	+3	-2	V	12	V	2
Cross Method	V (SO ₄)		Zn	26	Zn	16
AC	V ₂ (SO ₄) ₃		SO ₄	13	SO ₄	3

① 1:3
SO₄ 3-1
② 6:1
Zn 1-6
③ 1:2
V 2-1

Reaction	$\text{Sr}(\text{CN})_2 + \text{Ag}_2\text{CrO}_4 \rightarrow \text{SrCrO}_4 + 2 \text{AgCN}$ <p style="text-align: center;">Ag = +1</p>			
General Form	$\text{AB} + \text{CD} \rightarrow \text{AD} + \text{CB}$			

Formula	A	D (poly)	C	B (poly)	Reactants		Products	
Ion Charge	+2	-2	+1	-1	Sr	1	Sr	1
Cross Method	Sr(CrO ₄)		Ag(CN)		CN	2	CN	12
AD	* SrCrO ₄		AgCN**		Ag	2	Ag	12
CB					CrO ₄	1	CrO ₄	1

① 2:1
Ag 1-2

Don't forget + and - signs!

*Reduce
Sr(CrO₄)₂
2
SrCrO₄

**no (), CN = 1