

Name: _____ Official Class: _____ Date: _____
 Teacher: _____ Period: _____ Class: _____

Is This Reaction a Redox Reaction?

The Task:

- Looking at the 10 reactions below, determine if they are redox reactions.
- Create a mini CER poster for at least 2 of the equations – use the model below to help you.
- This is practice for your benefit and will not be collected.

Question: Is $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$ an example of a redox reaction?

Claim: Yes, we believe the reaction **IS** an example of a redox reaction

Evidence:

Fe ₂ O ₃	Fe	O	
Sub	2	3	
Ox #	+3	-2	
Total	+6	-6	0

CO	C	O	
Sub	1	1	
Ox #	+2	-2	
Total	+2	-2	0

CO ₂	C	O	
Sub	1	1	
Ox #	+4	-2	
Total	+4	-4	0

Fe has an oxidation number of 0 because it is all by it self

Reasoning: Yes, we believe the reaction **IS** an example of a redox reaction **BECAUSE** Fe is gaining electrons (+3 → 0) so it is being reduced, and C is losing electrons (+2 → +4) so it is being oxidized)

Name: Your chemistry teacher

The Reactions: Circle the correct choice

Model: $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$

- $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
- $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
- $\text{AgNO}_3 + \text{KCl} \rightarrow \text{AgCl} + \text{KNO}_3$
- $\text{NaCl} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{HCl}$
- $\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
- $\text{BaCl}_2 + \text{K}_2\text{SO}_4 \rightarrow 2\text{KCl} + \text{BaSO}_4$
- $\text{Cu} + 2\text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{Ag}$
- $\text{HCl} + \text{CaCO}_3 \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$
- $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$
- $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is a REDOX reaction

Is NOT a REDOX reaction

Is NOT a REDOX reaction

Is NOT a REDOX reaction

Is NOT a REDOX reaction

Is NOT a REDOX reaction

Is NOT a REDOX reaction

Is NOT a REDOX reaction

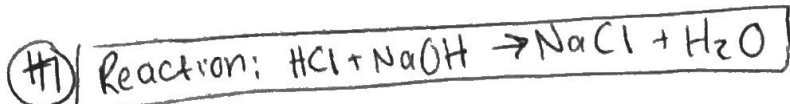
Is NOT a REDOX reaction

Is NOT a REDOX reaction

Is NOT a REDOX reaction

Is NOT a REDOX reaction

IS THIS A REDOX REACTION KEY



Claim: This is NOT a redox reaction

Evidence:

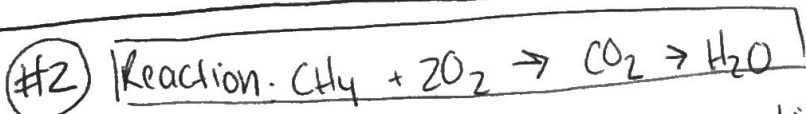
HCl	H	Cl	
sub	1	1	
ox#	+1	-1	
total	+1	-1	0

NaOH	Na	O	H
sub	1	1	1
ox#	+1	-2	+1
total	+1	-2	+1
			0

NaCl	Na	Cl	
sub	1	1	
ox#	+1	-1	
total	+1	-1	0

H ₂ O	H	O	
sub	2	1	
ox#	+1	-2	
total	+2	-2	0

Reasoning: This is not a redox reaction because the oxidation numbers do not change. ~~Electrons~~ Electrons are not lost or gained in this reaction



Claim: This IS a redox reaction

Evidence:

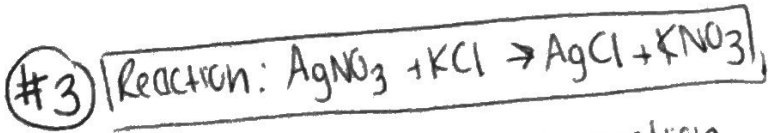
CH ₄	C	H	
sub	1	4	
ox#	-4	+1	
total	-4	+4	0

O₂ has an oxidation# of 0 because it is all by itself

CO ₂	C	O	
sub	1	2	
ox#	+4	-2	
total	+4	-4	0

H ₂ O	H	O	
sub	2	1	
ox#	+1	-2	
total	+2	-2	0

Reasoning: This IS a redox reaction. Oxygen's ox# goes from 0 → -2 meaning it gained electrons and was reduced. Carbon went from -4 to +4 meaning it lost electrons which is oxidation.



Claim: This is NOT a redox reaction

Evidence:

AgNO ₃	Ag	N	O	
Sub	1	1	3	
ox#	+1	+5	-2	
Total	+1	+5	-6	0

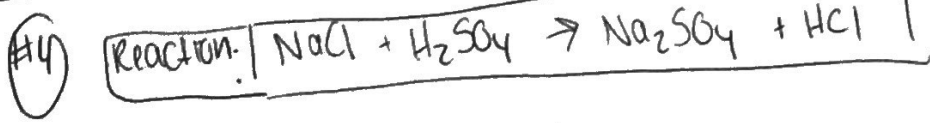
KCl	K	Cl	
Sub	1	1	
ox	+1	-1	
total	+1	-1	0

AgCl	Ag	Cl	
Sub	1	1	
ox#	+1	-1	
total	+1	-1	0

KNO ₃	K	N	O	
Sub	1	1	3	
ox #	+1	+5	-2	
total	+1	+5	-6	0

Reasoning:

This is not a redox reaction because the oxidation numbers do not change. Electrons are not lost or gained during the reaction.



Claim: This is NOT a redox reaction.

Evidence:

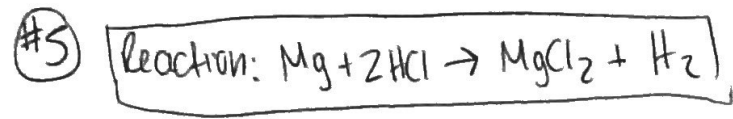
NaCl	Na	Cl	
Sub	1	1	
ox#	+1	-1	
total	+1	-1	0

H ₂ SO ₄	H	S	O	
Sub	2	1	4	
ox#	+1	+6	-2	
total	+2	+6	-8	0

Na ₂ SO ₄	Na	S	O	
Sub	2	1	4	
ox#	+1	+6	-2	
total	+2	+6	-8	0

HCl	H	Cl	
Sub	1	1	
ox#	+1	-1	
total	+1	-1	0

Reasoning: This is NOT a redox reaction because the oxidation numbers do not change. Electrons were not lost or gained during the reaction.



Claim: This IS a redox reaction

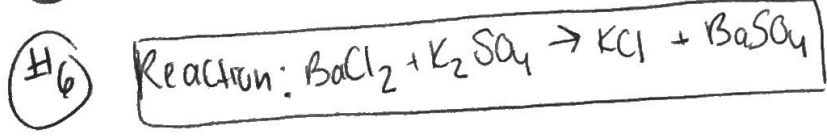
Evidence: Mg has an oxidation # of 0 bc it is by itself

HCl	H	Cl	/
sub	1	1	/
ox#	+1	-1	/
total	+1	-1	0

MgCl ₂	Mg	Cl	/
sub	1	2	/
ox#	+2	-1	/
total	+2	-2	0

H₂ has an oxidation # of 0 bc it is by itself

Reasoning: This is a redox reaction because oxidation numbers changed. Mg starts w/ a 0 and ends with +2 which means it lost two electrons and was oxidized. H started w/ +1 and ended w/ 0 which means it gained electrons and was reduced.



Claim: This is NOT a redox reaction.

Evidence:

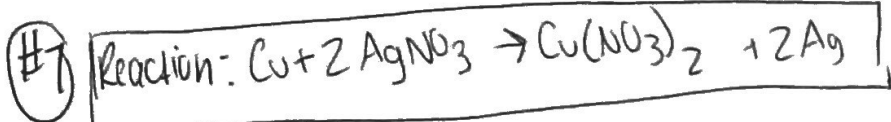
BaCl ₂	Ba	Cl	/
sub	1	2	/
ox#	+2	-1	/
total	+2	-2	0

K ₂ SO ₄	K	S	O	/
sub	2	1	4	/
ox#	+1	+6	-2	/
total	+2	+6	-8	0

KCl	K	Cl	/
sub	1	1	/
ox#	+1	-1	/
total	+1	-1	0

BaSO ₄	Ba	S	O	/
sub	1	1	4	/
ox#	+2	+6	-2	/
total	+2	+6	-8	0

Reasoning: This is NOT a redox reaction because the oxidation numbers did not change. Electrons were not lost or gained during the reaction.



Claim: This is a redox reaction.

Evidence: Cu has an ox # of 0 b/c it's by itself

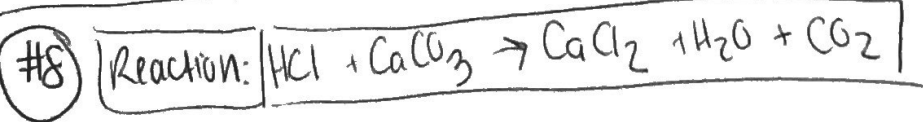
AgNO ₃	Ag	N	O	
sub	1	1	3	
ox #	+1	+5	-2	
total	+1	+5	-6	0

★ This is not a redox something

Cu(NO ₃) ₂	Cu	N	O	
sub	1	2	6	
ox #	+2	+5	-2	
total	+2	+10	-12	0

Ag has an ox # of 0 b/c it's by itself

Reasoning: this is a redox reaction because oxidation numbers changed. Cu started w/ an ox # of 0 and ended w/ +2 which means it lost 2 electrons and was oxidized. Ag started w/ an oxidation # of +1 and ended w/ a 0 which means it gained an electron which is ~~oxidation~~ reduction.



Claim: This is NOT a redox reaction.

Reasoning:

This is not a redox rxn b/c oxidation numbers did not change. Electrons were not lost or gained ~~any~~ during the reaction.

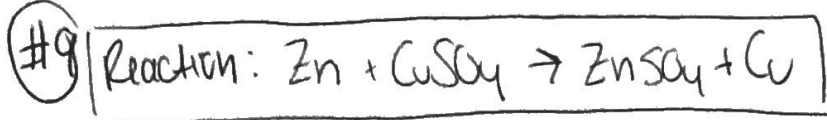
HCl	H	Cl	
sub	1	1	
ox #	+1	-1	
total	+1	-1	0

CaCO ₃	Ca	C	O
sub	1	1	3
ox #	+2	+4	-2
total	+2	+4	-6

CaCl ₂	Ca	Cl	
sub	1	2	
ox #	+2	-1	
total	+2	-2	0

H ₂ O	H	O	
sub	2	1	
ox #	+1	-2	
total	+2	-2	0

CO ₂	C	O	
sub	1	2	
ox #	+4	-2	
total	+4	-4	0



Claim: This is a redox reaction.

Evidence: Zn has an ox # of 0
Oblc it is by itself

ZnSO ₄	Zn	S	O	
sub	1	1	4	
ox#	+2	+6	-2	
total	+2	+6	-8	0

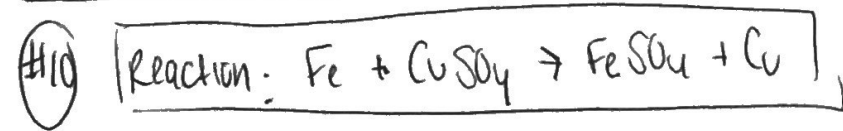
↙ takes another minute to think about

CuSO ₄	Cu	S	O	
sub	1	1	4	
ox#	+2	+6	-2	
total	+2	+6	-8	0

Cu has an ox # of 0
Oblc it is by itself

Reasoning: This is a redox reaction because oxidation numbers changed.

Zn start w/ 0 and ends w/ +2 which means it lost 2 electrons which is oxidation. Cu started w/ +2 and ended w/ 0 which means it gained 2 electrons which is reduction.



Claim: This is a redox reaction.

Evidence: Fe has an ox # of 0
Oblc it is by itself

FeSO ₄	Fe	S	O	
sub	1	1	4	
ox#	+2	+6	-2	
total	+2	+6	-8	0

CuSO ₄	Cu	S	O	
sub	1	1	4	
ox#	+2	+6	-2	
total	+2	+6	-8	0

Cu has an ox # of 0
Oblc it is by itself

Reasoning: This is a redox because oxidation numbers are changing. Fe starts w/ 0 and ended w/ +2 which means it lost 2 electrons which is oxidation. Cu started w/ +2 and ended w/ 0 which means it gained 2 electrons which is reduction.