

5.8 CLASS WORKSHEET – OXIDISING AND REDUCING AGENTS

Questions 1 – 5 will be assessed as Classwork (10 points)

Remember the rules from Worksheet 5.7 Part 2 (look them up again if you need to)

Also, read and note:

- If the charge on an atom increases (ie becomes more positive or less negative), the atom has been oxidised and is therefore behaving as a reducing agent
- If the charge on an atom decreases (ie becomes less positive or more negative), the atom has been reduced and is therefore behaving as an oxidizing agent

1. Define the terms:

oxidizing agent	electron acceptor
reducing agent	electron donor

2. Consider the reaction:

Ca	+	Cl ₂	→	CaCl ₂
0		0		+2 -1

Which atom is being oxidised?	Ca
Which atom is being reduced?	Cl
Which species is the oxidising agent in this reaction?	Cl ₂
How do you know?	Cl is reduced
Which species is the reducing agent in this reaction?	Ca
How do you know?	Ca is oxidized

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3. Consider the following reaction; write in the charge on each atom and hence identify the oxidising agent and the reducing agent in the reaction:

Reaction:	Mg	+	2HCl		→	MgCl ₂		+	H ₂
Charge on each atom	0		1+	1-		2+	1-		0

Oxidising agent:	H ⁺ or HCl
Reason:	It is reduced
Reducing agent:	Mg
Reason:	It is oxidised

4. Consider the following reaction; write in the charge on each atom and hence identify the oxidising agent and the reducing agent in the reaction:

Reaction:	Cl ₂	+	2NaBr		→	2NaCl		+	Br ₂
Charge on each atom	0		1+	1-		1+	1-		0

Oxidising agent:	Cl or Cl ₂
Reason:	Cl is reduced
Reducing agent:	NaBr or Br ⁻
Reason:	Br is oxidized

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5. Consider the following reaction; write in the charge on each atom and hence identify the oxidising agent and the reducing agent in the reaction:

Reaction:	Zn	+	CuCl ₂		→	ZnCl ₂		+	Cu
Charge on each atom	0		2+	1-		2+	1-		0

Oxidising agent:	CuCl ₂ or Cu ²⁺
Reason:	Cu is reduced
Reducing agent:	Zn
Reason:	Zn is oxidized

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Question 5 will be assessed as Homework (10 points)

6. For each of the three equations below, add the charges to the atoms and hence identify the atom which is oxidised, the atom which is reduced, the oxidising agent and the reducing agent

a)	Equation	2Mg	+	O ₂	→	2MgO	
	Charges	0		0		2+	2-

Atom oxidised	Mg
Atom reduced	O
Oxidising agent	O or O ₂
Reducing agent	Mg

b)	Equation	2Fe ³⁺	+	Sn ²⁺	→	2Fe ²⁺	+	Sn ⁴⁺
	Charges	3+		2+		2+		4+

Atom oxidised	Sn
Atom reduced	Fe
Oxidising agent	Fe ³⁺
Reducing agent	Sn ²⁺

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c)	Equation	CuO		+	Zn	→	ZnO		+	Cu
	Charges	2+	2-		0		2+	2-		0

Atom oxidised	Zn
Atom reduced	Cu
Oxidising agent	CuO
Reducing agent	Zn