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5.7 CLASS WORKSHEET – OXIDISING AND REDUCING AGENTS

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

1. Explain the meaning of the terms:

Oxidising agent	electron acceptor
Reducing agent	electron donor

2. Consider the reaction: $\text{Ca} + \text{Cl}_2 \rightarrow \text{CaCl}_2$

Charges on each atom: 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
How do you know?	It is being reduced, so causing the Ca to be oxidised
Which species is the reducing agent in this reaction?	Ca
How do you know?	It is being oxidised, so causing the Cl to be reduced

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	+	2H^+	\rightarrow	Mg^{2+}	+	H_2
Charge on each atom	0		+1		+2		0

Oxidising agent:	H^+
Reason:	It is reduced, so it is taking electrons away from the Mg, causing the Mg to be oxidised
Reducing agent:	Mg
Reason:	It is oxidized, so it is giving electrons to the H^+ , causing the H^+ to be reduced

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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	+	2Br ⁻	→	2Cl ⁻	+	Br ₂
Charge on each atom	0		-1		-1		0

Oxidising agent:	Cl ₂
Reason:	It is reduced, so accepts electrons from the Br ⁻ , causing it to be oxidised
Reducing agent:	Br ⁻
Reason:	It is oxidised, so gives electrons to the Cl ₂ , causing it to be reduced

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:	Cu ²⁺ or CuCl ₂
Reason:	It is reduced, so it accepts electrons from the Zn, causing it to be oxidized
Reducing agent:	Zn
Reason:	It is oxidized, so it gives electrons to the Cu ²⁺ , causing it to be reduced

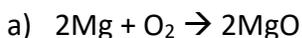
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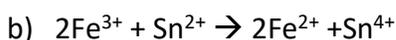
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Questions 6 – 7 will be assessed as Homework (10 points)**6. For each of the three equations below, identify the:**

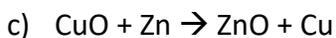
- atom which is oxidised
- atom which is reduced
- the oxidising agent
- the reducing agent



Atom oxidised	Mg
Atom reduced	O
Oxidising agent	O_2
Reducing agent	Mg



Atom oxidised	Sn
Atom reduced	Fe
Oxidising agent	Fe^{3+}
Reducing agent	Sn^{2+}



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

7. Oxidising and reducing agents can be both useful and dangerous.

Conduct some internet research. Identify a useful oxidising agent and state why it is useful.
Identify a useful reducing agent and state why it is useful.

		Reason for usefulness
Useful oxidising agent	Eg Cl_2 or I_2 or NaClO	Sterilizing wounds, killing bacteria
Useful reducing agent	SO_2 Na_2SO_3	Anti-oxidants; preserving food