

MINISTRY OF EDUCATION, HERITAGE AND ARTS
YEAR 13 CHEMISTRY
REVISION WORKSHEET 10

Write the answers to the following questions in your exercise/activity books.

Strand 3: Reactions

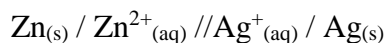
Sub-strand: Electrochemistry

- State the definitions of the following terms.
 - Standard reduction potential (SRP/ E°) **(1 mark)**
 - Cell potential (E_{cell}) **(1 mark)**
 - Standard cell potential (E°_{cell}) **(1 mark)**
- The SRP value can be used to determine the strength of an oxidising agent and a reducing agent.

Use the table below on SRP/ E° values to answer the questions that follow.

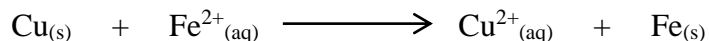
Couple	SRP/ E° Value (V)
$\text{Au}^+_{(\text{aq})}/\text{Au}_{(\text{s})}$	+1.42
$\text{Cu}^{2+}_{(\text{aq})}/\text{Cu}_{(\text{s})}$	+0.34
$\text{Co}^{2+}_{(\text{aq})}/\text{Co}_{(\text{s})}$	-0.28
$\text{Mg}^{2+}_{(\text{aq})}/\text{Mg}_{(\text{s})}$	-2.37

- Identify the couple which is the strongest oxidising agent. **(1 mark)**
 - Provide a reason for your answer to part (i) above. **(2 marks)**
- Calculate the standard cell potential (E°_{cell}) for the following galvanic cell.



(E° /SRP: $\text{Ag}^+_{(\text{aq})} / \text{Ag}_{(\text{s})} = +0.80 \text{ V}$; $\text{Zn}^{2+}_{(\text{aq})} / \text{Zn}_{(\text{s})} = -0.76 \text{ V}$) **(3 marks)**

- Use the reaction equation below to answer the questions that follow.



(E° /SRP: $\text{Cu}^{2+}_{(\text{aq})} / \text{Cu}_{(\text{s})} = +0.34 \text{ V}$; $\text{Fe}^{2+}_{(\text{aq})} / \text{Fe}_{(\text{s})} = -0.44 \text{ V}$)

- Show that the above reaction is **non-spontaneous**. **(3 marks)**
[Hint: The E°_{cell} has to be calculated first to determine spontaneity.]
- Write the equation for the **spontaneous** reaction for the same cell mentioned above. **(2 marks)**

The End