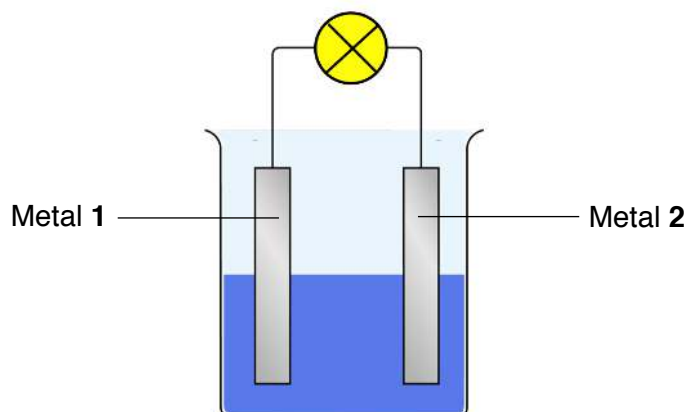


0	1
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A student investigated simple cells using the apparatus shown in the figure below.

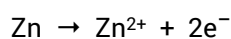


- If metal 2 is more reactive than metal 1 then the voltage measured is positive.
- If metal 1 is more reactive than metal 2 then the voltage measured is negative.
- The bigger the difference in reactivity of the two metals, the larger the voltage produced.

The student's results are shown in the table below.

Metal 2 \ Metal 1	Chromium	Copper	Iron	Tin	Zinc
Chromium	0.0 V				
Copper	1.2 V	0.0 V			
Iron	0.5 V	not measured	0.0 V		
Tin	0.8 V	-0.4 V	0.3 V	0.0 V	
Zinc	0.2 V	-1.0 V	-0.3 V	-0.6 V	0.0 V

The ionic equation for the reaction occurring at the zinc electrode in the simple cell made using copper and zinc electrodes is:



0	1	.	1
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Zinc is oxidised in this reaction.

Give a reason why this is oxidation.

[1 mark]

*(zinc has) lost electron(s)*

*accept loss of electrons*

Look at the table above.

0	1	.	2
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Which **one** of the metals used was the least reactive?

[2 marks]

Give a reason for your answer.

Metal..... copper is the least reactive.....

Reason ..... because it gave the most negative voltage when it was metal 2.....  
 or  
 ..... it gave the biggest voltage with chromium.....  
 or  
 ..... it gave the most positive voltage when it was metal 1.....

0	1	.	3
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Predict the voltage that would be obtained for a simple cell that has iron as metal 1 and copper as metal 2.

[3 marks]

Explain your answer.

..... -0.7 V..... [1].....

..... The voltage with chromium and copper is 1.2..... [1].....  
 ..... accept use of other cell pairings such as tin with copper and tin with iron.....

..... The voltage with chromium and iron is 0.5 and copper is less reactive (than iron)..... [1].....

(Total 6 marks)

End