Seb Academy
Topic: Redox
Time: 40 min
Date: _____
Name: _____

Redox Homework 1

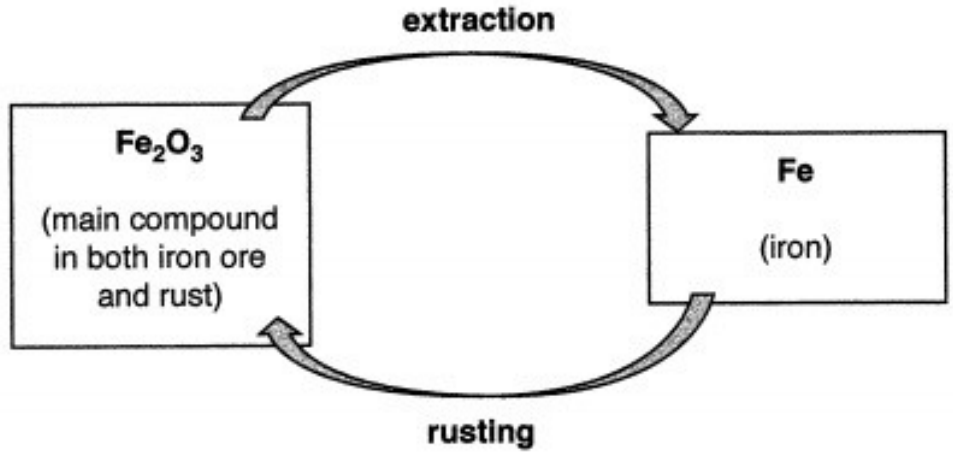
- State the Oxidation Number of each of the elements that is underlined.

• $H_2\underline{O}_2$	• $H_4\underline{As}_2O_7$	• $\underline{N}O$
• $NaClO_3$	• $K_2Cr_2O_7$	• $K\underline{Mn}O_4$
• $\underline{Mn}Cl$	• $H_2S_4O_6$	• $H_2S_2O_8$

[6]

(2016/O/GCSE/2) Skill 3 Rusting

- (2016/O/GCSE/2) Many parts of a bicycle contain iron. One problem with using iron is that it rusts. The diagram shows the cycle of changes that happen when iron is extracted and then rusts.



Use oxidation states to show which change involves oxidation and which change involves reduction.

[2]

[Total 2 marks]

(Foundational) Copper reacts with heated concentrated nitric acid

- Copper reacts with heated concentrated nitric acid to yield a brown acidic gas nitrogen dioxide, copper (II) nitrate and water.

(a) Write a balanced chemical equation, with state symbols, for the reaction.

[1]

(b) Complete the table below.

Element	Initial Oxidation State	Final Oxidation State
Copper		
Nitrogen		

[2]

(c) Explain in terms of oxidation states, whether the reaction is a redox reaction.

[2]

[Total 6 marks]

(2012/HC/S4/IP/FE/3) Skill 3 Copper (I) oxide + sulfuric acid

- Copper (I) oxide is a red-brown solid. It reacts with excess sulfuric acid to form copper (II) sulfate, copper and one other product.

(a) Write the balanced chemical equation for the reaction.

[1]

(b) Describe what is seen when copper (I) oxide is added to excess dilute sulfuric acid.

[2]

(c) State which substance has been oxidized and reduced in this redox reaction. Explain your answer in terms of change in oxidation state.

[2]

(d) This is known as a disproportionation reaction. From your answer in (b), deduce one characteristic feature of a disproportionation reaction.

[1]

[Total 6 marks]

(Foundational) Sy

- A metallic element, Sy, forms compounds in which its oxidation states are +2 and +3. The element is displaced from solutions of its salts by zinc metal.

(a) Using the symbol Sy for the element, write the formulae of the element's two oxides

[2]

(b) Zinc metal and an aqueous solution of the chloride of Sy whose oxidation state is +2 reacts to form zinc chloride and metal Sy. Give the chemical equation for the reaction.

[1]

(c) In terms of electron gain/loss, explain why the reaction in (b) is considered a redox.

[2]

(d) Compounds of element Sy in oxidation state of +3 are powerful oxidising agents. Describe a test to show this.

[2]

(e) Predict two other properties of element Sy.

[2]

[Total: 9]

(2015/O/GCSE/N) Skill 1 Redox with Periodicity

- The table the **most common** oxidation states of some elements, **A**, **B**, **C**, **D** and **E** in their compounds

Element	Most common oxidation states	Metal or non-metal?
A	-2	
B	+2, +3, +4, +6, +7	
C	+1	Non-metal
D	+3	
E	-1	

(a) Complete the table by filing in the last column to show which elements are **metals** and which are **non-metals.**

[1]

(b) Use the letters **A**, **B**, **C**, **D** and **E** to answer the following questions.

(i) Which element is most likely to be hydrogen?

[1]

(ii) Which element is most likely to be in Group VI?

[1]

(iii) Which element is most likely to form coloured compounds?

[1]

(c) No elements from Group 0 appear in the table. Use the information in the table to explain why this statement is true.

[2]