

6 Reversible reactions and redox – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
reversible	可逆	_____
oxidation	氧化	_____
reduction	还原	_____
redox	氧化还原	_____
reversible reaction	可逆反应	_____
hydrated	水合	_____
anhydrous	无水	_____
closed system	密闭系统	_____
equilibrium	平衡	_____
oxidising agent	氧化剂	_____
reducing agent	还原剂	_____

Recall

Some reactions can go **both ways** — they are **reversible** 可逆. And **oxidation** 氧化 and **reduction** 还原 always happen together in a **redox** 氧化还原 reaction.

- A reversible reaction is shown by $\rightleftharpoons$.
- “Redox” is short for reduction–oxidation.

Nothing here is hard — it just adds the right words.

New ideas

Read these first, then do the Practice.

■ 1 Reversible reactions

A **reversible reaction** 可逆反应 can go forwards and backwards. A good example:

- blue **hydrated** 水合 copper(II) sulfate, when heated, loses its water $\rightarrow$ white **anhydrous** 无水 copper(II) sulfate.
- adding water turns it **blue** again (this is a test for water).

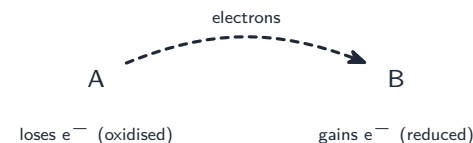


In a **closed system** 密闭系统, a reversible reaction reaches **equilibrium** 平衡 when the **forward** and **reverse** rates are equal.

■ 2 Redox: OIL RIG

- **oxidation** 氧化 is **loss** of electrons.
- **reduction** 还原 is **gain** of electrons.

Remember **OIL RIG**: Oxidation Is Loss, Reduction Is Gain.



- an **oxidising agent** 氧化剂 oxidises another substance (and is itself reduced).

- a **reducing agent** 还原剂 reduces another substance (and is itself oxidised).

Watch out: OIL RIG — Oxidation Is Loss of electrons, Reduction Is Gain. The **oxidising agent** is itself *reduced* (it takes the electrons); the **reducing agent** is itself *oxidised*. At equilibrium the forward and reverse rates are equal — the reaction has **not** stopped.

Practice

Try these in order.

6.1 What symbol shows a reversible reaction? [1]

6.2 Heating blue hydrated copper(II) sulfate gives a white solid. Name the change and the white solid. [2]

6.3 How could you turn the white solid blue again, and what does this test for? [2]

6.4 What does OIL RIG stand for? [2]

6.5 An oxidising agent oxidises another substance. What happens to the oxidising agent itself? [1]

6.6 **Challenge.** In the reaction $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$, zinc gives electrons to the copper ions. State which substance is **oxidised** and which is the **oxidising agent**. [2]