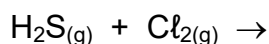


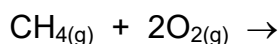
OXIDATION - REDUCTION: HYDROGEN LOSS & GAIN

The ideas concerning oxidation and reduction were later extended to include substances which **lose hydrogen** (*oxidation*) or **gain hydrogen** (*reduction*).



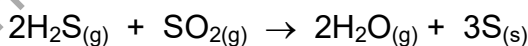
- 3 (a) Explain which substance is **oxidized** in the above reaction and what product is formed as a result. [2]
-
- (b) Explain which substance is **reduced** in the above reaction and what product is formed as a result. [2]
-
- (c) What substance behaves as the **oxidizing agent** in this reaction? [1]
-
- (d) What substance behaves as the **reducing agent** in the process? [1]
-

The hydrogen-based definition may be particularly useful where organic compounds are involved:



It is evident that the carbon is oxidized (loses all four hydrogens) and that part of the oxygen is reduced (gains hydrogen). Beyond i/GCSE, further examples are encountered, particularly within organic chemistry, where this approach is profitable, for instance in the conversion of an aldehyde (RCHO) to an alcohol (RCH₂OH), where R = alkyl, C_nH_{2n+1}.

A reaction that requires both of the definitions mentioned so far to be employed in order to explain, in the simplest terms, what is oxidized and what is reduced occurs when hydrogen sulphide reacts with sulphur dioxide in the presence of traces of water:



- 4 (a) Explain which substance is **oxidized** in the above reaction and what product is formed as a result. [2]
-
- (b) Explain which substance is **reduced** in the above reaction and what product is formed as a result. [2]
-
- (c) What substance behaves as the **oxidizing agent** in this reaction? [1]
-
- (d) What substance behaves as the **reducing agent** in the process? [1]
-

N.B. Typically *both* hydrogen sulphide and sulphur dioxide act as *reducing agents*.