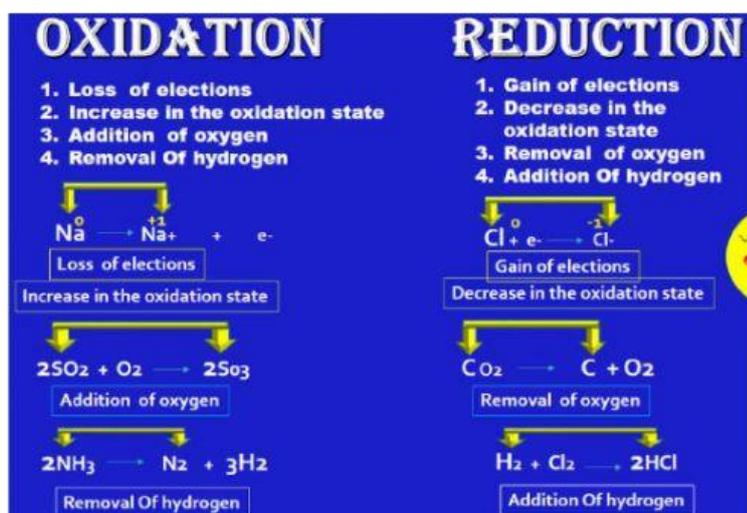


Balancing redox equation (Ion inspection method)

1) Determine species undergo oxidation and reduction



2) Separate the half equation

3) Balance the metal at both sides

4) Balance non-metal other than H and O at both sides

5) Balance the O by adding H₂O at the other side of equation

6) Balance the H by adding H⁺ at the other side

7) Balance the charge by adding e⁻ at positive side

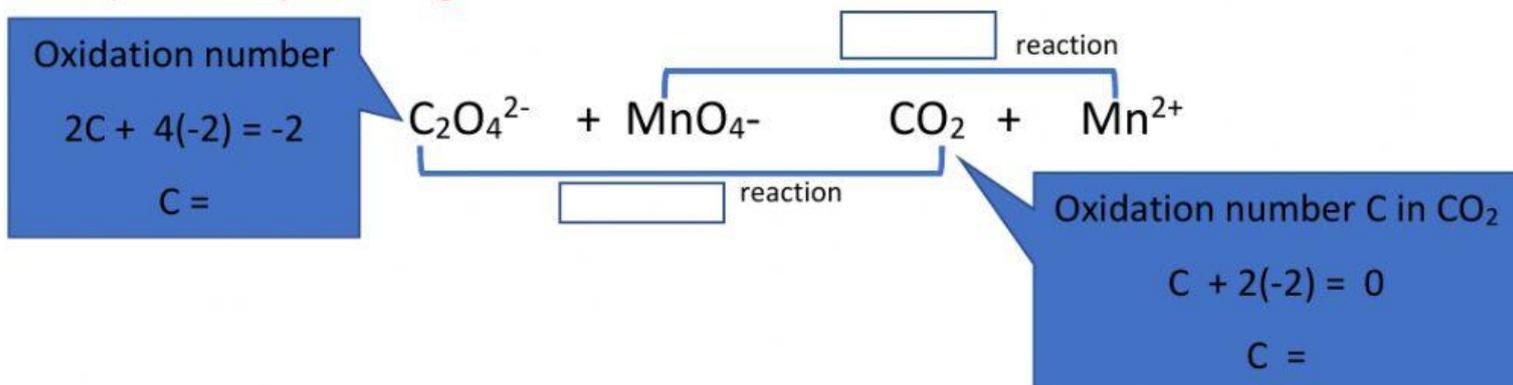
8) Combine both half equations by removing the e from both equations

9) Recheck

Tutorial Chapter 4 Question 2

A redox reaction between oxalate ions, C₂O₄²⁻ and permanganate ions, MnO₄⁻ in an acidic solution produces carbon dioxide, CO₂ and manganese(II) ions, Mn²⁺. Write a balanced equation for the above reaction.

1) Determine species undergo oxidation and reduction



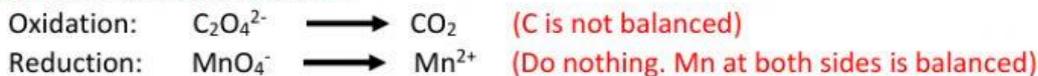
Oxidation number of C has . C in C₂O₄²⁻ is

MnO₄⁻ loss Oxygen to form Mn²⁺. Mn in MnO₄⁻ is

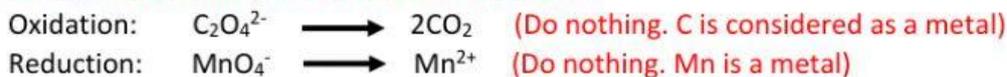
2) Separate the half equation



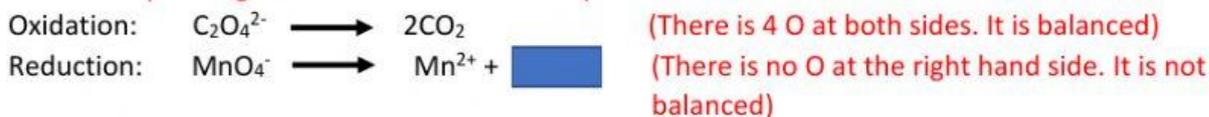
3) Balance the metal at both sides



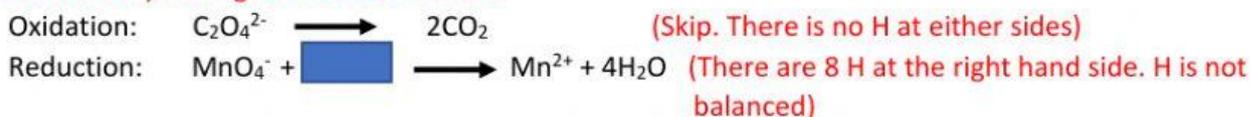
4) Balance non-metal other than H and O at both sides



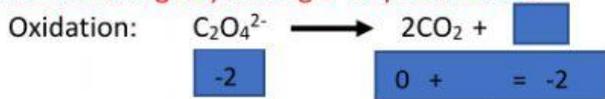
5) Balance the O by adding H₂O at the other side of equation



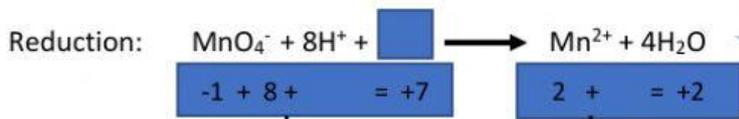
6) Balance the H by adding H⁺ at the other side



7) Balance the charge by adding e⁻ at positive side



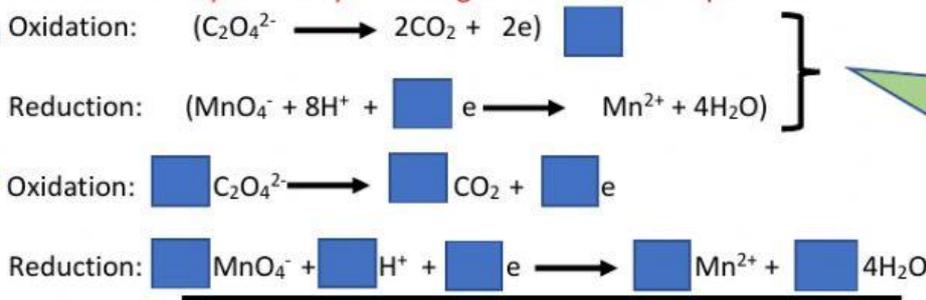
Charge for both sides are balanced after \square are added to the +ve side



Charge for both sides are balanced after \square are added to the +ve side

Initially, it is +7 on the left and +2 at the right-hand side. Thus, the charge is not balanced

8) Combine both half equations by removing the e from both equations



Both equations have different number of electrons. How do you want to balance the e for both equations?



Recheck: Mn= Mn=
 O= O=
 H= H=

Net Charge=

Net Charge=