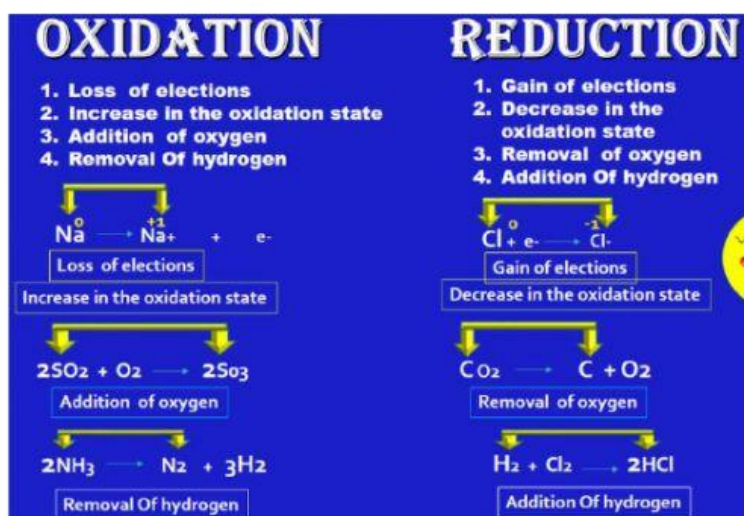


Balancing redox equation (Ion inspection method)

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

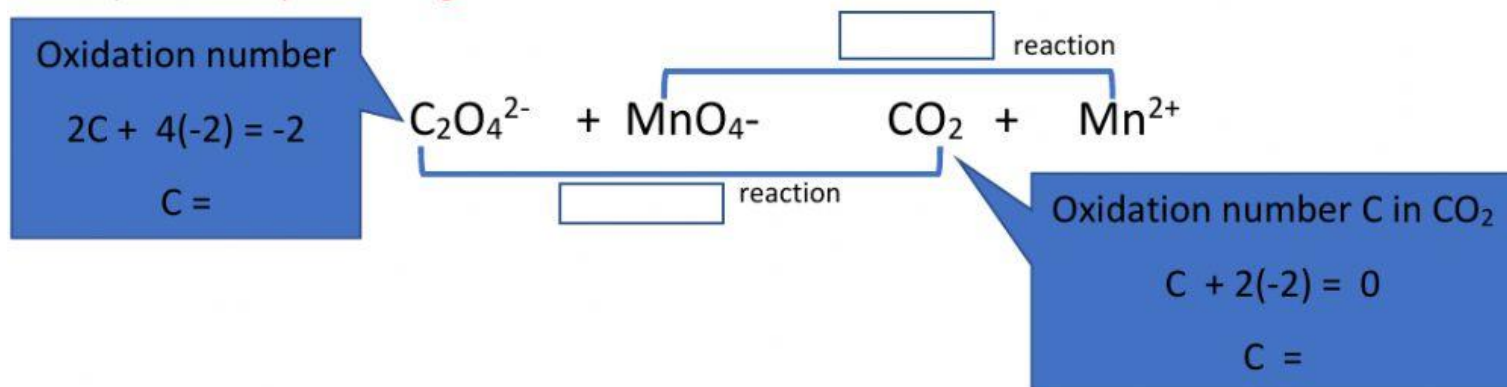
8) Combine both half equations by removing the e from both equations

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.

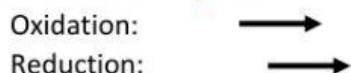
1) Determine species undergo oxidation and reduction



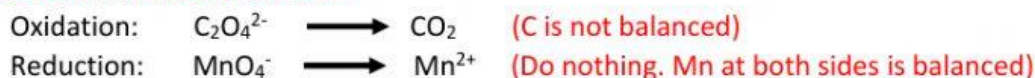
Oxidation number of C has . C in C₂O₄²⁻ is

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

2) **Separate the half equation**



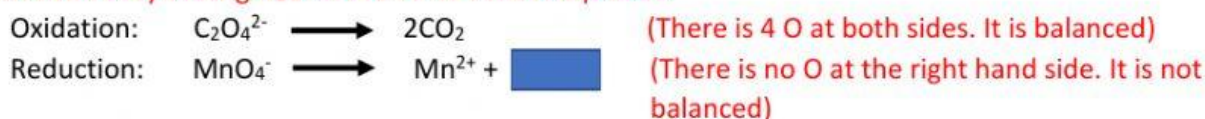
3) **Balance the metal at both sides**



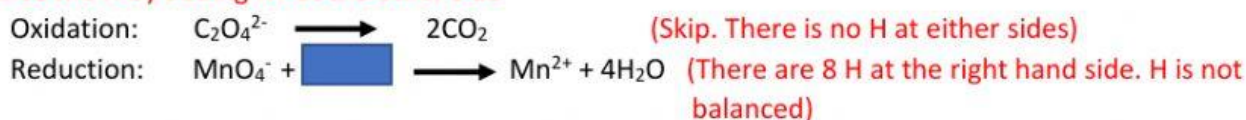
4) **Balance non-metal other than H and O at both sides**



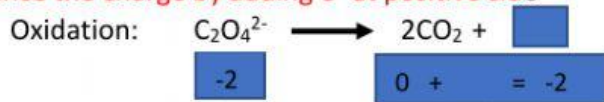
5) **Balance the O by adding H₂O at the other side of equation**



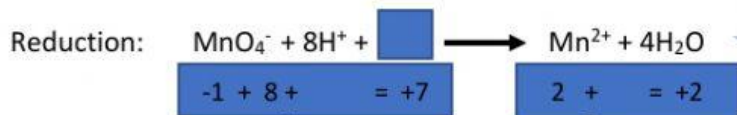
6) **Balance the H by adding H⁺ at the other side**



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



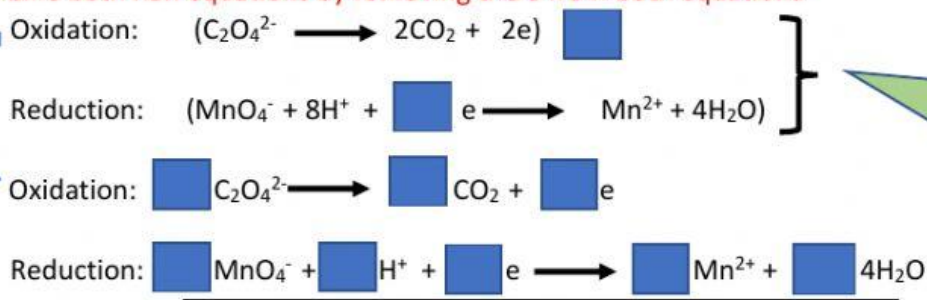
Charge for both sides are balanced after _____ are added to the +ve side



Charge for both sides are balanced after _____ 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=
O=
H=

Mn=
O=
H=

Net Charge=

Net Charge=