Answer the questions below then check your answers

1. What is the oxidation state of each of the following elements?

a. Na b. Cl c. OH^- d. SO_4^{2-} e. NO_3^-

2. Write down the oxidation state of sulfur in each of the following:

a. S b. SO_2 c. SO_3 d. $Na_2S_2O_3$ e. SO_3^{2-}

3. What is the oxidation state of the metal(s) in each of the following:

a. iron (III) oxide b. $KMnO_4^-$ c. $Na_2Cr_2O_7^{2-}$

4. What is the oxidation state of:

a. Chlorine in phosphorus pentachloride?

b. Fluorine and oxygen in oxygen difluoride?

c. Fluorine and oxygen in dioxygen difluoride?

d. Chromium in potassium chromate (VI)?

5. What is the oxidation state of oxygen in a:

   - Oxide?
   - Peroxide?
   - Superoxide?

6. In a chemical reaction MnO_4^{2-} is changed into MnO_4^-. In terms of oxidation numbers what has changed in this reaction? Is this reaction an oxidation or a reduction ?

Answers

1. What is the oxidation state of each of the following elements?

a. Na b. Cl c. OH^- d. SO_4^{2-} e. NO_3^-

a. Na oxidation is 0, its an element.

b. Cl oxidation state is 0 its an element

c. O oxidation state is -2, hydrogen is +1

d. S oxidation state is +6, oxygen is -2.

e. N oxidation state is +5, oxygen is -2

2. Write down the oxidation state of sulfur in each of the following:

a. S b. SO_2 c. SO_3 d. $Na_2S_2O_3$ e. SO_3^{2-}

a. 0 b. +4 c. +6 d. +4 e. +4

3. What is the oxidation state of the metal(s) in each of the following:

a. iron (III) oxide b. $KMnO_4^-$ c. $Na_2Cr_2O_7^{2-}$

a. Fe is +3 b. potassium is +1 c. Na is +1, Cr is +6

Mn is +6

4. What is the oxidation state of:

a. Chlorine in phosphorus pentachloride? -1

b. Fluorine and oxygen in oxygen difluoride? OF_2, oxygen oxidation state +2

c. Fluorine and oxygen in dioxygen difluoride? O_2F_2, oxygen oxidation state +1

d. Chromium in potassium chromate (VI)? K_2CrO_4 oxidation state of chromium is +6

5. What is the oxiddation state of oxygen in a:

- Oxide? -2
- Peroxide? -1
- Superoxide? -1/2

6. In a chemical reaction MnO_4^{2-} is changed into MnO_4^-. In terms of oxidation numbers what has changed in this reaction? Is this reaction an oxidation or a reduction ?

The manganese ion has increased its oxidation number from +6 to +7, it has been oxidised.