

Oxidation Numbers Practice Worksheet

1. Define oxidation number. How is the oxidation number of an element determined?

2. What is the oxidation state, and how does it differ from the oxidation number?

3. Why does fluorine always show a -1 oxidation number?

4. What is the oxidation state of copper in CuSO_4 ?

5. The oxidation state of oxygen in hydrogen peroxide (H_2O_2) is _____

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Answers

1. Define oxidation number. How is the oxidation number of an element determined?

The total number of electrons an atom gains (or loses) to form a bond with another atom is called its oxidation number.

There are a few things to consider when it comes to oxidation numbers. For instance, a neutral molecule always has no charge, so the oxidation numbers of its various components will always add up to zero. For an ion, the oxidation numbers of the multiple elements will add up to its charge.

2. What is the oxidation state, and how does it differ from the oxidation number?

An atom's oxidation state is equal to the number of electrons removed or added to it so that it can form a bond with another atom. Functionally, there isn't a difference between oxidation state and oxidation number, and the two can be used interchangeably.

However, for a coordination compound, the oxidation number is equal to the charge of its central atom.

3. Why does fluorine always show a -1 oxidation number?

As the most electronegative element on the periodic table, whenever fluorine is bonded with another atom, it attracts the electrons in the bond to it strongly. As a result, fluorine will only show a '-1' oxidation number.

4. What is the oxidation state of copper in CuSO_4 ?

+2

Here, we must consider that copper has formed a bond with the sulfate ion (SO_4^{2-}), which has a charge of -2. For CuSO_4 to remain neutral, the oxidation state of copper has to be +2.

5. The oxidation state of oxygen in hydrogen peroxide (H_2O_2) is _____

-1

As each hydrogen has an oxidation number of +1, each oxygen atom must have a charge of -1 so that H_2O_2 remains neutral.