

# Redox potential

**Oxidation-reduction potential** (redox potential) is a measurement of **the ability of substances to bind or release electrons**, i.e. is a measurement of the strength of an oxidizing or reducing agent.

**Electron affinity can be expressed as the potential to which an electrode immersed in a solution containing oxidized and reduced form of the same substance is charged** - we call this system a half-cell.

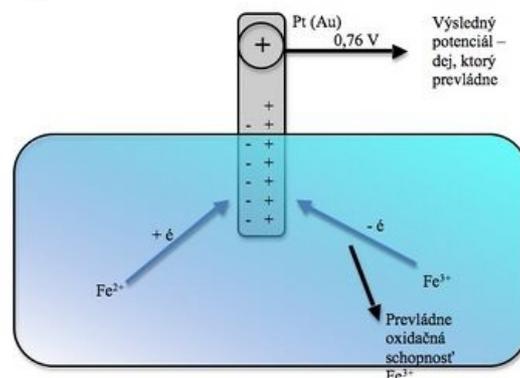
As soon as we dip an electrode made of a noble metal (platinum or gold wire) into a solution containing equal amounts of the reduced and oxidized form of the same substance, this electrode is charged to a certain potential due to the solution.

## Example

We note two conflicting events:

- ferrous ions tend to donate electrons to the electrode and create an excess of negative charge on it, they are **oxidized** to ferric ions,
- ferric ions try to take electrons from the electrode and thereby **reduce** themselves to ferrous, thus creating an excess of positive charge on it.

**The resulting potential** to which the electrode is charged depends on **which of the events prevails**, in our case the oxidizing ability of ferric ions prevails and the electrode is charged positively to a value of 0.76 V (at the same eastern concentration of both ions).



down - ox. potential of Fe<sup>3+</sup> is higher, up - final potential

## Measurement of redox potential

We are not able to measure absolute values of redox potentials, so we compare them with so-called **reference electrodes** - they have a known and constant potential.

- both electrodes (reference and the one whose potential we want to measure) are immersed in the same solution and connected by a so-called salt bridge (most often a KCl solution) - this creates a galvanic cell.

An international agreement establishes a **system of hydrogen, hydrogen cation and a platinum electrode** as the basis for measuring redox potentials. The redox potential of this group is, by agreement, **zero** and serves as **the basis of the scale of redox potentials**.

## Links

### Related articles

- Electrochemistry

### External links

- Becket series of metals ([https://en.wikipedia.org/wiki/Galvanic\\_series](https://en.wikipedia.org/wiki/Galvanic_series))

## References

- STOKLASOVÁ, Alena - KŘÍŽALA, Josef - ŠIMAN, Pavel. *Obecná, fyzikální a anorganická chemie pri studující medicíny*. 1. edition. Praha : Karolinum, 1996. vol. 1. pp. 91. ISBN 80-7066-949-7.