**Electrical Potential** (page 62 in your text)

[FlexBooks® 2.0](https://flexbooks.ck12.org/flexbooks)  >  [CK-12 Chemistry For High School](https://flexbooks.ck12.org/cbook/ck-12-chemistry-flexbook-2.0)  >  23.5 Electrical Potential

**Electrical Potential**

Electrical potential is a measurement of the ability of a galvanic/voltaic cell to produce an electric [current](https://www.ck12.org/c/physical-science/current?referrer=crossref) and is typically measured in volts (V). The [voltage](https://www.ck12.org/c/physics/voltage?referrer=crossref) that is produced by a given galvanic/voltaic cell is a result of the electrical potential difference between the two half-[cells](https://www.ck12.org/c/biology/cells?referrer=crossref). Fundamentally you can think of it as a numerical measure of the difference between the electronegativity of the oxidant (oxidising agent) in reduction half-cell, and the reductant in the oxidation half-cell.

It is not possible to measure the electrical potential of an isolated half-cell though. For example, if only a zinc half-cell were constructed, no complete redox reaction, no electron exchange, can occur and so no electrical potential can be measured. It is only when another half-cell is combined with the zinc half-cell that an electrical potential difference, or voltage, can be measured. Thus,

the electrical potential value is a difference between half-cells, and can’t actually describe one half-cell by itself.

The electrical potential of a cell results from a [competition](https://www.ck12.org/c/life-science/competition?referrer=crossref) for electrons. In a zinc-copper voltaic cell, it is the copper (II) ions that will be reduced to copper metal. That is because the Cu2+ ions have a greater attraction (electronegativity) for electrons than the Zn2+ ions in the other half-cell. This means the copper ions remove electrons from the Zinc metal - the zinc metal is oxidized. The **reduction potential** is a measure of the tendency of a given half-reaction to occur as a reduction in an electrochemical cell. In a given voltaic cell, the half-cell that has the greater reduction potential is the one in which reduction will occur. In the Zinc/Copper galvanic cell, the copper has a higher reduction potential. In the half-cell with the lower reduction potential, oxidation will occur. In the Zinc/Copper galvanic cell, the zinc half-cell has a lower reduction potential. The **cell potential (Ecell)** is the difference in reduction potential between the two half-[cells](https://www.ck12.org/c/biology/cells?referrer=crossref) in an electrochemical cell.

 Review

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| 1. Why can’t we measure the electrical potential of an isolated half-cell? |
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| 1. What does the reduction potential tell us? |
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| 1. What is the cell potential? |
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