
What is ORP and How Does an ORP Meter Work
By
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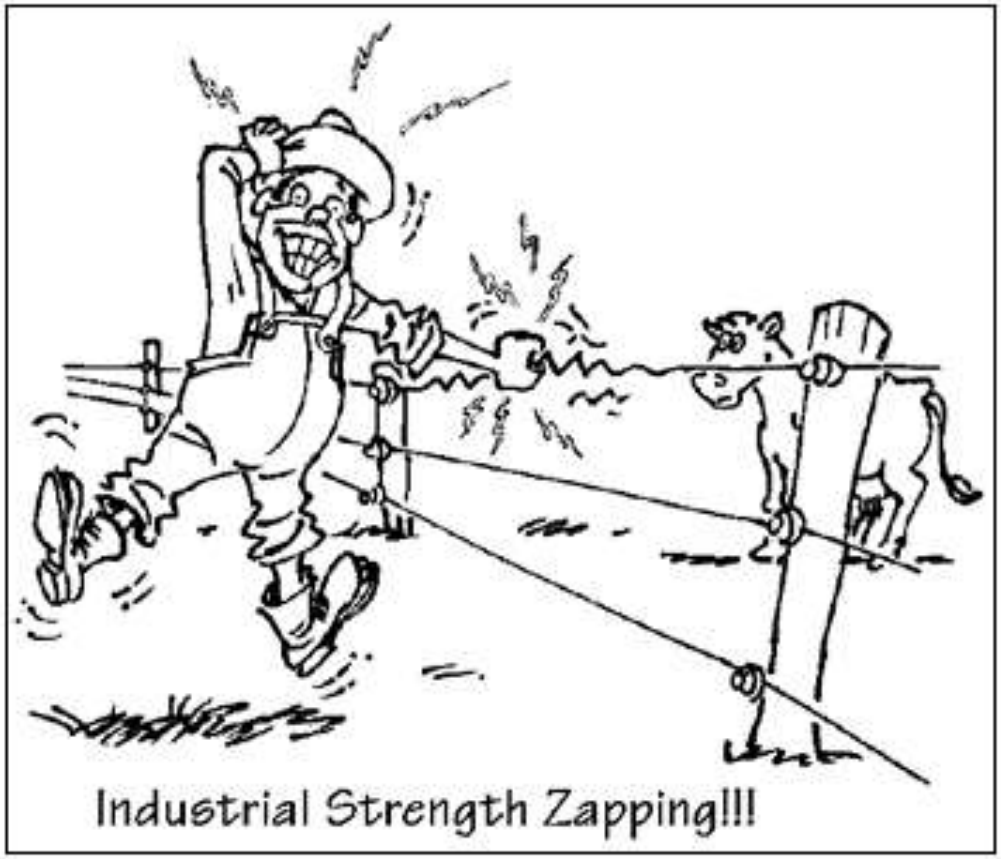
VERY SIMPLY- It is a measurement of an positive/negative electrons in a liquid



Oxidation-Reduction Potential Info from WEF MOP 37

- **O**xidation-**R**eduction **P**otential is a measurement of the ABILITY of a solution to **accept** or **donate** ELECTRONS.

+ **Positive ORP** Value indicates the ability to **ACCEPT** electrons in an oxidative environment (oxygen present)

- **Negative ORP** Value indicates the ability to **DONATE** electrons in a reductive environment (no oxygen available)

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From Robert's Hot Tubs!!!

- ORP Meter is **REALLY** just a millivolt meter, measuring the voltage across two electrodes (poles).
  - A reference electrode constructed of silver wire (negative pole)
  - A measuring electrode constructed of a platinum band (positive pole),
  - With the wastewater between Negative/Positive Poles

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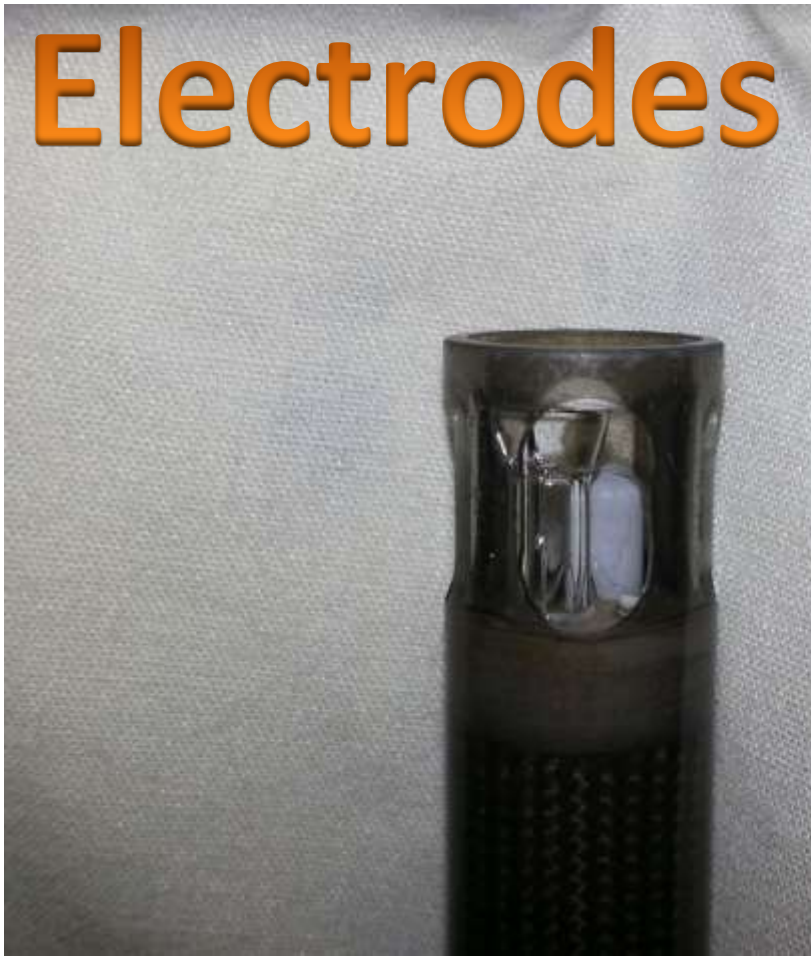
Reference & Platinum Electrodes



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- The reference electrode
  - Surrounded by salt (electrolyte) solution that produces tiny voltage.
  - Voltage produced by the reference electrode is constant and stable
- It provides a reference against which the voltage generated by the platinum measuring electrode and the oxidizers in the water may be compared.
- The difference in voltage between the two electrodes is what is actually measured by the meter.

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- ORP electrodes are almost always combination electrodes, both electrodes are housed in one body - so it appears that it is just one "probe."
- Meter's circuitry very sensitive so it can measure the very tiny voltages generated by the circuit.

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- "Oxidation-Reduction" is used with a hyphen because the two chemical reactions are really "joined at the hip" - one cannot occur without the other also occurring.
- From http://www.rhtubs.com/ORP.htm

FYI

%$##*!@@#$

FROM YSI - TIPS, CAUTIONS AND LIMITATIONS

- ORP sensors can show a **slow response** in environmental water if the platinum button of the probe has been **contaminated** with extraneous material. Common contaminants include hard water deposits, **oil/grease, or other organic matter.**

FYI

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FROM HACH - INTRODUCTION TO OXIDATION REDUCTION POTENTIAL MEASUREMENT

- ORP measurement readings occur slowly compared to pH measurements. While a pH value can be obtained within seconds, a stable ORP value **can take up to several minutes**, if not hours, to reach the final equilibrium due to the type of reactions and their reaction rates.

Again from Hach Website

- Oxidation-Reduction Potential (ORP or Redox Potential) measures an aqueous system's capacity to either release or accept electrons from chemical reactions.
- When a system tends to accept electrons, it is an oxidizing system.
- When it tends to release electrons, it is a reducing system. A system's reduction potential may change upon introduction of a new species or when the concentration of an existing species changes.

Put it All Together

- ORP meter assigns a numeric value to a liquid's ability to;
- *Accept electrons denoting an increased the valence (chemical) bond **[GLUE]** The liquid will have more of a positive charge.*

OR

- *Donate electrons denoting a decreased the valence (chemical) bond. The liquid will have less positive charge to it, i.e. more of a negative charge.*


Thank You
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