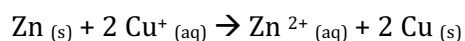


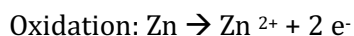
- |  |
|--|
| <ol style="list-style-type: none"><li>1. Half-Reactions</li><li>2. Balancing Redox Reactions</li></ol> |
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<b>Half-Reactions</b>
-----------------------

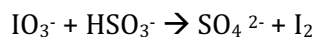
Consider the following reaction:



- Notice that 2 Cu<sup>+</sup> ions are reduced for every 1 Zn atom oxidized.
- It is possible to separate out the reduction and oxidation portions of a redox reaction.
- **Half-reactions: an equation representing either an oxidation or a reduction including the number of electrons lost or gained.**



<p><b><u>Consider the following reaction:</u></b></p>
---



Oxidation:

Reduction:

**Balancing Half-Reactions Steps:**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

- Most reactions occur in acidic conditions. However, if it is stated that the reaction takes place in basic conditions...

**Practice:**

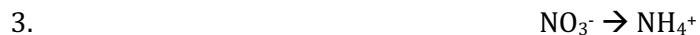
Balance the following half-reactions. Also state whether this is an oxidation or a reduction:



- Balance major atoms.       Balance O's.       Balance H's.       Balance charge. (check!)
- 



- Balance major atoms.       Balance O's.       Balance H's.       Balance charge. (check!)
- 



- Balance major atoms.       Balance O's.       Balance H's.       Balance charge. (check!)
- 



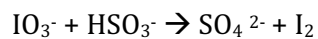
- Balance major atoms.       Balance O's.       Balance H's.       Balance charge. (check!)
-

## Balancing Redox Reactions:

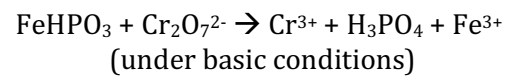
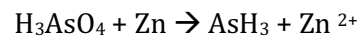
### Rules:

- 1.
- 2.
- 3.
- 4.
- 5.

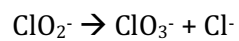
### Practice:



- Separate into two half reactions. (Look for common atoms to help you.)
- Balance each half reaction. (There must be an electron gain in one side and loss on the other!)
- Balance the electron loss and gain. (check oxidation numbers!)
- Add the balanced half-reactions together, cancelling where appropriate.

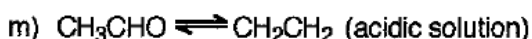
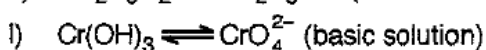
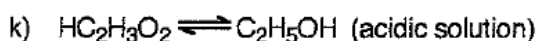
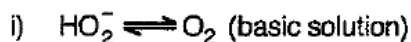
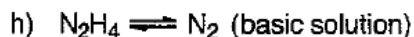
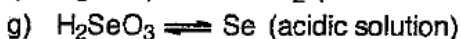
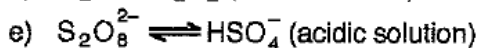
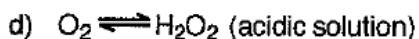
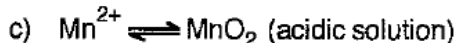
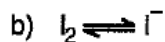
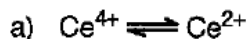


**A disproportionation reaction is a redox reaction in which the same species is both reduced and oxidized.** Since there is only one reactant, the reactant must be involved in both the reduction reaction and the oxidation reaction.



**EXERCISE:**

19. Balance the following half-reactions.

**EXERCISE:**

24. Balance the following redox equations.

