

Name

Can I determine if a reaction is an Oxidation/Reduction reaction?

Determination of oxidation states will help you determine if a reaction is in fact transferring charge (e-)

1. Assign oxidation states to the following reaction and indicate whether it is an oxidation reduction reaction.
2. If the reaction is an Oxidation/Reduction reaction, indicate who is being oxidized and who is being reduced.

$$2\text{HNO}_3(\text{aq}) + 3\text{H}_3\text{AsO}_3(\text{aq}) \Rightarrow 2\text{NO}(\text{g}) + 3\text{H}_3\text{AsO}_4(\text{aq}) + \text{H}_2\text{O}(\text{l})$$

$$\text{NO}_2(\text{g}) + \text{H}_2(\text{g}) \Rightarrow \text{NH}_3(\text{g}) + \text{H}_2\text{O}(\text{l})$$

$$\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \Rightarrow \text{NaNO}_3(\text{aq}) + \text{AgCl}(\text{s})$$

$$\text{AgNO}_3(\text{aq}) + \text{Cu} \Rightarrow \text{Cu}(\text{NO}_3)_2 + \text{Ag}$$

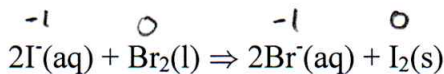
$$\text{CH}_4 + \text{O}_2 \Rightarrow \text{CO}_2 + \text{H}_2\text{O}$$

$$2\text{I}^-(\text{aq}) + \text{Br}_2(\text{l}) \Rightarrow 2\text{Br}^-(\text{aq}) + \text{I}_2(\text{s})$$

$$\text{Pb} + \text{PbO}_2 + \text{H}_2\text{SO}_4 \xrightarrow{\text{Discharge}} 2\text{PbSO}_4 + 2\text{H}_2\text{O}$$

Handwritten notes:
 Ox/Red charges are changing
 Red → HNO₃ N: 3e⁻ + 5 → +2
 Ox → H₃AsO₃ As: +3 → +5 + 2e⁻
 Ni e⁻ + 4 → -3 H₂: 0 → +1 + e⁻
 Cu: 0 → +2 + e⁻ Ox
 Ag: +1 → 0 Red
 C: -4 → +4 + e⁻
 O: 0 → -2
 Ni: +1 → +2
 I: 0 → +2
 Not Redox
 Red Ox
 Red Ox
 Ox Red
 I: -1 → 0 + e⁻
 False
 Pb: 0 → +2 + e⁻
 PbO₂: +4 → +2

2. 3. Given the redox reaction:



Is the following statement true or false? If false, fix.

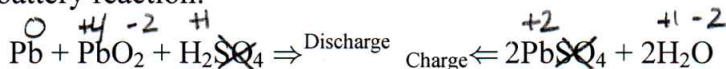
The I⁻ ion is oxidized, and changes from -1 to -2.



False



3. 4. Given the lead-acid battery reaction:



Which species is oxidized during battery discharge?

- Pb
 PbO₂
 SO₄²⁻
 H₂O

