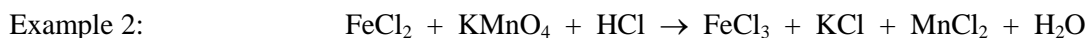


## 21 • Electrochemistry

### OXIDATION-REDUCTION EQUATIONS

#### The Half-Reaction Method:

1. Write the equation as two half-reactions. Include the particles (atoms, ions, molecules) that are involved in change of oxidation state.
2. Balance each half-reaction with respect to atoms and charges; first atoms other than H and O, then O with H<sub>2</sub>O and H with H<sup>+</sup>, and ionic charges with electrons (e<sup>-</sup>).
3. Equalize the number of electrons lost in the oxidation half-reaction with the number of electrons gained in the reduction half-reaction.
4. Add the two half-reactions to form a balanced net ionic equation.
5. (Basic solution) Add OH<sup>-</sup> ions to each side of the equation to neutralize H<sup>+</sup> ions. Cancel H<sub>2</sub>O molecules.



**PROBLEMS:** Balance these equations:

