

2nd Semester Final Review - Oxidation Reduction

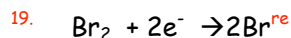
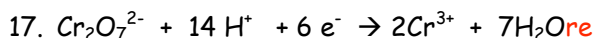
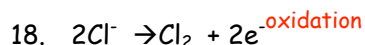
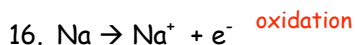
1. Define oxidation- **losing of electrons, increase in oxidation number**
2. Define reduction- **gaining of electrons, reduced oxidation number**
3. What is an oxidizing agent- **the substance being reduced, forces the oxidation**
4. What is a reducing agent?- **the substance being oxidized, forces the reduction**
5. What is transferred in a redox reaction? **electrons**

Assign oxidation numbers to each element in the following compounds.

	Formula		
6.	H ₂ O	H +1	O -2
7.	H ₂	H 0	
8.	NO	N +2	O -2
9.	NO ₂	N +4	O -2
10.	NO ₃ ⁻	N 0	O -2

	Formula		
11.	MgCl ₂	Mg +2	Cl -1
12.	CaO	Ca +2	O -2
13.	PO ₄ ³⁻	P +5	O -2
14.	SO ₄ ²⁻	S +6	O -2
15.	KCl	K +1	Cl -1

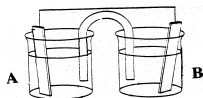
Identify each of the following reactions as oxidation or reduction reactions.



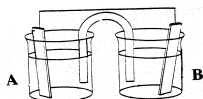
In the following equations, write the oxidation and reduction half reactions.

	Reaction	Oxidation half rxn	Reduction half rxn
20.	$2\text{H}^+(\text{aq}) + \text{Zn}(\text{s}) \rightarrow \text{Zn}^{2+}(\text{aq}) + \text{H}_2(\text{g})$	$\text{Zn} \rightarrow \text{Zn}^{2+} + 2e^-$	$2\text{H}^+ + 2e^- \rightarrow \text{H}_2$
21.	$2\text{AgNO}_3(\text{aq}) + \text{Cu}(\text{s}) \rightarrow \text{Cu}(\text{NO}_3)_2(\text{aq}) + \text{Ag}(\text{s})$	$\text{Cu} \rightarrow \text{Cu}^{2+} + 2e^-$	$2\text{Ag}^+ + 2e^- \rightarrow 2\text{Ag}$
22.	$\text{KMnO}_4 + \text{HCl} \rightarrow \text{KCl} + \text{MnCl}_2 + \text{H}_2\text{O} + \text{Cl}_2$	$2\text{Cl}^- \rightarrow \text{Cl}_2 + 2e^-$	$\text{Mn}^{7+} + 3e^- \rightarrow \text{Mn}^{4+}$

20. Write the anode, cathode and overall reaction when a Tin electrode is put in a solution of SnCl₂ in beaker A and a Strip of Iron electrode is placed into a solution of FeCl₂ in beaker B. The standard reduction potential of Sn²⁺ is -.14 volts and the standard reduction potential of Fe²⁺ is -0.44 volts



21. Write the anode, cathode and overall reaction when a Chromium electrode is placed in a solution of CrCl₃ in beaker A and a lead electrode is placed in a solution of Pb(NO₃)₂ in beaker B. The standard reduction potential of Pb²⁺ is -.13 volts and the standard reduction potential of Cr³⁺ is -0.473 volts.



22. Explain the purpose of the salt bridge and which ions flow in which direction across it.

The salt bridge prevents the build up of charge. Anions flow towards the anode and cations flow toward the cathode.