1. Which balanced equation represents a redox reaction?
   A) $Mg + Cl_2 \rightarrow MgCl_2$
   B) $CaO + H_2O \rightarrow Ca(OH)_2$
   C) $HNO_3 + NaOH \rightarrow NaNO_3 + H_2O$
   D) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$

2. Which equation represents an oxidation-reduction reaction?
   A) $H^+ + OH^- \rightarrow H_2O$
   B) $^{238}_{92}U \rightarrow {}^{234}_{90}Th + {}^{4}_{2}He$
   C) $Zn + Sn^{4+} \rightarrow Zn^{2+} + Sn^{2+}$
   D) $3AgNO_3 + Li_3PO_4 \rightarrow Ag_3PO_4 + 3LiNO_3$

3. Which balanced equation represents an oxidation-reduction reaction?
   A) $Ba(NO_3)_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaNO_3$
   B) $H_3PO_4 + 3KOH \rightarrow K_3PO_4 + 3H_2O$
   C) $Fe(s) + S(s) \rightarrow FeS(s)$
   D) $NH_3(g) + HCl(g) \rightarrow NH_4Cl(s)$

4. Which balanced equation represents a redox reaction?
   A) $AgNO_3(aq) + NaCI(aq) \rightarrow AgCI(s) + NaNO_3$ (aq)
   B) $H_2CO_3(aq) \rightarrow H_2O(\ell) + CO_2(g)$
   C) $NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O(\ell)$
   D) $Mg(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$

5. Which balanced equation represents a redox reaction?
   A) $PCl_5 \rightarrow PCl_3 + Cl_2$
   B) $KOH + HCl \rightarrow KCl + H_2O$
   C) $LiBr \rightarrow Li^+ + Br^-$
   D) $Ca^{2+} + SO_4{}^{2-} \rightarrow CaSO_4$

6. Which equation represents an oxidation- reduction reaction?
   A) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$
   B) $H_2SO_4 + Ca(OH)_2 \rightarrow CaSO_4 + 2H_2O$
   C) $MgCrO_4 + BaCl_2 \rightarrow MgCl_2 + BaCrO_4$
   D) $Zn(NO_3)_2 + Na_2CO_3 \rightarrow 2NaNO_3 + ZnCO_3$

7. In which reaction are electrons transferred from one reactant to another reactant?
   A) $2Ca(s) + O_2(g) \rightarrow 2CaO(s)$
   B) $AgNO_3(aq) + KCl(aq) \rightarrow AgCl(s) + KNO_3(aq)$
   C) $HCl(aq) + NaOH(aq) \rightarrow NaCl(aq) + H_2O(\ell)$
   D) $H_3O^+(aq) + OH^-(aq) \rightarrow 2H_2O(\ell)$

8. Which balanced equation represents a redox reaction?
   A) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$
   B) $BaCl_2 + K_2CO_3 \rightarrow BaCO_3 + 2KCl$
   C) $CuO + CO \rightarrow Cu + CO_2$
   D) $HCl + KOH \rightarrow KCl + H_2O$

9. Which reaction is an example of an oxidation-reduction reaction?
   A) $AgNO_3 + KI \rightarrow AgI + KNO_3$
   B) $Cu + 2\ AgNO_3 \rightarrow Cu(NO_3)_2 + 2\ Ag$
   C) $2\ KOH + H_2SO_4 \rightarrow K_2SO_4 + 2\ H_2O$
   D) $Ba(OH)_2 + 2\ HCl \rightarrow BaCl_2 + 2\ H_2O$

10. Which reaction is an example of oxidation-reduction?
    A) $KOH + HCl \rightarrow KCl + H_2O$
    B) $2\ KCl \rightarrow 2\ K + Cl_2$
    C) $BaCl_2 + K_2SO_4 \rightarrow 2\ KCl + BaSO_4$
    D) $KCl + AgNO_3 \rightarrow AgCl + KNO_3$

11. In the reaction:

    $$2\ CrO_4^{2-}(aq) + 2\ H^+(aq) \rightarrow Cr_2O_7^{2-}(aq) + H_2O(\ell),$$

    the oxidation number of chromium
    A) decreases
    B) increases
    C) remains the same

12. Which equation represents an oxidation-reduction reaction?
    A) $HCl + KOH \rightarrow KCl + H_2O$
    B) $4\ HCl + MnO_2 \rightarrow MnCl_2 + 2\ H_2O + Cl_2$
    C) $2\ HCl + CaCO_3 \rightarrow CaCl_2 + H_2O + CO_2$
    D) $2\ HCl + FeS \rightarrow FeCl_2 + H_2S$

13. Which is a redox reaction?

A) $H^+ + Cl^- \rightarrow HCl$
B) $NaOH + HCl \rightarrow NaCl + H_2O$
C) $Fe + 2\ HCl \rightarrow FeCl_2 + H_2$
D) $MgO + H_2SO_4 \rightarrow MgSO_4 + H_2O$

14. Which is a redox reaction?

A) $Ba^{2+} + SO_4^{2-} \rightarrow BaSO_4$
B) $H^+ + OH^- \rightarrow H_2O$
C) $Sn^0 + Sn^{4+} \rightarrow 2\ Sn^{2+}$
D) $H^+ + NH_3 \rightarrow NH_4^+$

15. Which is a redox reaction?

A) $2\ KBr + F_2 \rightarrow 2\ KF + Br_2$
B) $2\ HCl + Mg(OH)_2 \rightarrow 2\ HOH + MgCl_2$
C) $2\ NaCl + H_2SO_4 \rightarrow Na_2SO_4 + 2\ HCl$
D) $Ca(OH)_2 + Pb(NO_3)_2 \rightarrow Ca(NO_3)_2 + Pb(OH)_2$

16. Which equation represents a redox reaction?

A) $MgO + H_2O \rightarrow Mg(OH)_2$
B) $FeS + 2\ HCl \rightarrow FeCl_2 + H_2S$
C) $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$
D) $2\ O_3 \rightarrow 3\ O_2$

17. Which equation represents a redox reaction?

A) $SO_2 + H_2O \rightarrow H_2SO_3$
B) $SO_3^{2-} + 2\ H^+ + \rightarrow H_2SO_3$
C) $O_2 + 2\ H_2 \rightarrow 2\ H_2O$
D) $OH^- + H^+ \rightarrow H_2O$

18. Which is a redox reaction?

A) $Mg + 2\ HCl \rightarrow MgCl_2 + H_2$
B) $Mg(OH)_2 + 2\ HCl \rightarrow MgCl_2 + 2\ H_2O$
C) $Mg^{2+}(aq) + 2\ OH^-(aq) \rightarrow Mg(OH)_2$
D) $MgCl_2 + 6\ H_2O \rightarrow MgCl_2 \bullet 6\ H_2O$

19. Given the equations *A*, *B*, *C*, and *D*:

(*A*) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$ (*B*) $Cl_2 + H_2O \rightarrow HClO + HCl$
(*C*) $CuO + CO \rightarrow CO_2 + Cu$
(*D*) $NaOH + HCl \rightarrow NaCl + H_2O$

Which two equations represent redox reactions?

A) *A* and *B*
B) *B* and *C*
C) *C* and *A*
D) *D* and *B*

20. Which equation represents a redox reaction?

A) $2\ Na^+ + S^{2-} \rightarrow Na_2S$
B) $H^+ + C_2H_3O_2^- \rightarrow HC_2H_3O_2$
C) $NH_3 + H^+ + Cl^- \rightarrow NH_4^+ + Cl$
D) $Cu + 2\ Ag^+ + 2\ NO_3^- \rightarrow 2\ Ag + Cu^{2+} + 2\ NO_3^-$