1. In the reaction

$$Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s),$$

the species oxidized is

A) Zn(s) B) Cu(s)
C) $Cu^{2+}(aq)$ D) $Zn^{2+}(aq)$

2. In the reaction

$$2\ Al + 3\ Ni(NO_3)_2 \rightarrow 2\ Al(NO_3)_3 + 3\ Ni,$$

the aluminum is

A) reduced and its oxidation number increases
B) reduced and its oxidation number decreases
C) oxidized and its oxidation number increases
D) oxidized and its oxidation number decreases

3. In the reaction

$$2\ Na + Cl_2 \rightarrow 2\ Na^+ + 2\ Cl^-,$$

what species is oxidized?

A) Na B) $Cl_2$ C) $Na^+$ D) $Cl^-$

4. Which half-reaction shows both the conservation of mass and the conservation of charge?

A) $Cl_2 + 2e^- \rightarrow 2\ Cl$ B) $Cl_2 \rightarrow Cl^- + 2e^-$
C) $2\ Br^- + 2e^- \rightarrow Br_2$ D) $Br^- \rightarrow Br_2 + 2e^-$

5. Given the unbalanced equation:

$$\_\_ Fe + \_\_ Ag^+ \rightarrow \_\_ Ag + \_\_ Fe^{3+}$$

When the equation is correctly balanced using smallest whole numbers, the coefficient of $Ag^+$ is

A) 5 B) 2 C) 3 D) 4

6. Given the unbalanced equation:

$$Cr^0 + Sn^{2+} \rightarrow Cr^{3+} + Sn^0$$

What is the coefficient in front of the $Cr^{3+}$ when the equation is balanced using smallest whole number coefficients?

A) 1 B) 2 C) 3 D) 6

7. Given the reaction:

$$\_\_ Hg^{2+} + \_\_ Ag \rightarrow \_\_ Hg + \_\_ Ag^+$$

When the equation is completely balanced using the smallest whole number coefficients, the coefficient of Hg will be

A) 1 B) 2 C) 3 D) 4

8. Given the unbalanced equation:

$$\_\_ Mg(s) + \_\_ Fe^{3+} \rightarrow \_\_ Mg^{2} + \_\_ Fe(s)$$

When the equation is completely balanced using smallest whole numbers, the coefficient of Mg(s) will be

A) 1 B) 2 C) 3 D) 4

9. Given the unbalanced equation:

$$Ca^0 + Al^{+3} \rightarrow Ca^{+2} + Al^0$$

When the equation is completely balanced with the smallest whole number coefficients, what is the coefficient of $Ca^0$?

A) 1 B) 2 C) 3 D) 4

10. Given the reaction:

$$3\ Sn^{4+}(aq) + 2\ Cr(s) \rightarrow 3\ Sn^{2+}(aq) + 2\ Cr^{3+}(aq)$$

Which half-reaction correctly represents the reduction that occurs?

A) $Sn^{4+}(aq) + 2e^- \rightarrow Sn^{2+}(aq)$
B) $Sn^{2+}(aq) \rightarrow Sn^{4+}(aq) + 2e^-$
C) $Cr(s) \rightarrow Cr^{3+}(aq) + 3e^-$
D) $Cr^{3+}(aq) + 3e^- \rightarrow Cr(s)$