

Chem12 Oxidation and Reduction : Test 1b - 50

1) Define : Reduction -

2)a) A piece of zinc is placed in hydrochloric acid (HCl). Bubbles are observed. Write down the net ionic equation (redox equation) for the reaction.

b) Which species is the reducing agent ?

3) Give the oxidation number of Xe in the species Na_4XeO_6 .

4) Is this a redox reaction : $2\text{NaBr} + \text{Cl}_2 \rightarrow 2\text{NaCl} + \text{Br}_2$?

5) Why do we balance redox reactions ?

6) Balance the half reaction : $\text{Br}_2 \rightarrow \text{BrO}_3^-$ in acid solution.

7) Balance the half reaction : $\text{MnO}_4^- \rightarrow \text{MnO}_2$ in basic solution.

8) Four elements K, L, M, N, can also exist as ions : K^{2-} , L^{2-} , M^{1-} , N^{1-} . M reacts with K^{2-} , L^{2-} , and N^{1-} . L reacts with N^{1-} , but not with M^{1-} . N does not react with M^{1-} or L^{2-} . K reacts with N^{1-} , but not with L^{2-} .

Arrange the balanced oxidation half reactions in order with the strongest oxidizer on top.

9) Predict which reactions are spontaneous. Label S or N.S.

a) $\text{Mg} + \text{Sn}^{2+}$ b) $\text{Cu} + \text{Cl}_2$ c) $\text{Mn} + \text{Cs}^+$

10) Which of the following will spontaneously oxidize Cu to Cu^{2+} ? Put Y or N.

a) Sn^{2+} to Sn^{4+} b) Pb^{2+} to Pb c) Al^{3+} to Al d) MnO_4^- to Mn^{2+}

Answers : 1) It is the gain of electrons., 2)a) $\text{Zn} + 2\text{H}^+ \rightarrow \text{Zn}^{2+} + \text{H}_2$, b) Zn , 3) +8, 4) Yes, oxidation numbers for Br and Cl change., 5) Atoms and charge must be conserved., 6) $\text{Br}_2 + 6\text{H}_2\text{O} \rightarrow 2\text{BrO}_3^- + 12\text{H}^+ + 10\text{e}^-$, 7) $\text{MnO}_4^- + 2\text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{MnO}_2 + 4\text{OH}^-$, 8) $\text{M} + \text{e}^- \rightarrow \text{M}^-$, $\text{L} + 2\text{e}^- \rightarrow \text{L}^{2-}$, $\text{K} + 2\text{e}^- \rightarrow \text{K}^{2-}$, $\text{N} + \text{e}^- \rightarrow \text{N}^-$, 9)a) s, b) s, c) ns, 10)a) N, b) N, c) N, d) Y.