氧化还原 练习

- 1. Determine the oxidation number of the elements in each of the following compounds: 求下列物质的氧化数
 - a. H₂CO₃
 - $b. N_2$
 - c. Zn(OH)₄²⁻
 - d. NO₂
 - e. LiH
 - f. Fe₃O₄



2. Identify the species being oxidized and reduced in each of the following reactions:

列出哪种元素被氧化和还原

a.
$$Cr^+ + Sn^{4+} \rightarrow Cr^{3+} + Sn^{2+}$$

b.
$$3 \text{ Hg}^{2+} + 2 \text{ Fe (s)} \rightarrow 3 \text{ Hg}_2 + 2 \text{ Fe}^{3+}$$

c. 2 As (s) + 3 Cl₂ (g)
$$\rightarrow$$
 2 AsCl₃

3. Would you use an oxidizing agent or reducing agent in order for the following reactions to occur?

下列元素是属于氧化剂还是还原剂?

a.
$$ClO_3 \rightarrow ClO_2$$

b.
$$SO_4^{2-} \rightarrow S^{2-}$$

c.
$$Mn^{2+} \rightarrow MnO_2$$

d.
$$Zn \rightarrow ZnCl_2$$

4. Write balanced equations for the following redox reactions:

配平下列氧化还原反应式

a.
$$NaBr + Cl_2 \rightarrow NaCl + Br_2$$

b.
$$Fe_2O_3 + CO \rightarrow Fe + CO_2$$
 in acidic solution

c.
$$CO + I_2O_5 \rightarrow CO_2 + I_2$$
 in basic solution

5. Write balanced equations for the following reactions:

试写出和平衡下列氧化还原方程式

a.
$$Cr(OH)_3 + Br_2 \rightarrow CrO_4^{2-} + Br^-$$
 in basic solution

b.
$$O_2 + Sb \rightarrow H_2O_2 + SbO_2^-$$
 in basic solution

c.
$$HCOOH + MnO_4^- \rightarrow CO_2 + Mn^{2+}$$
 in acidic solution

d. $ClO_2^- \rightarrow ClO_2 + Cl^-$ in acidic solution

6. Write the balanced half reactions of the following reactions:

试写出下列化学方程式的半反应式

a. $NiO_2 + 2 H_2O + Fe \rightarrow Ni(OH)_2 + Fe(OH)_2$ in basic solution

b. $CO_2 + 2 NH_2OH \rightarrow CO + N_2 + 3 H_2O$ in basic solution

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c. $2 \text{ H}^+ + \text{H}_2\text{O}_2 + 2 \text{ Fe}^{2+} \longrightarrow 2 \text{ Fe}^{3+} + 2 \text{ H}_2\text{O}$ in acidic solution

d. $H^+ + 2 H_2O + 2 MnO_4^- + 5 SO_2 \longrightarrow 2 Mn^{2+} + 5 HSO_4^-$ in acidic solution