Class 11 Chemistry · Chapter 7: Redox Reactions

Worksheet · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

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1. In the classical sense (addition or removal of oxygen, hydrogen or an electronegative element), which of the following conversions is a reduction? [1]

(a) $2FeCl_2 \rightarrow 2FeCl_3$, on passing chlorine

(b) $CH_3CH_2OH \rightarrow CH_3CHO$, on removing two hydrogen atoms

(c) $ZnO \rightarrow Zn$, on heating zinc oxide with carbon

(d) $2Cu \rightarrow 2CuO$, on heating copper in air

2. Which of the following decomposition reactions is NOT a redox reaction? [1]

(a) $2Ag_2O(s) \rightarrow 4Ag(s) + O_2(g)$

(b) $2NaNO_3(s) \rightarrow 2NaNO_2(s) + O_2(g)$

(c) $NH_4Cl(s) \rightarrow NH_3(g) + HCl(g)$

(d) $(NH_4)_2Cr_2O_7(s) \rightarrow N_2(g) + Cr_2O_3(s) + 4H_2O(g)$

3. Vanadium pentoxide, V_2O_5, written in Stock notation is [1]

(a) $V_2(X)O_5$

(b) $V_2(V)O_5$

(c) $V(II)_2O_5$

(d) $V_2(II)O_5$

4. Hydrogen has an oxidation number of −1 in [1]

(a) H_2S

(b) NH_4^+

(c) HF

(d) MgH_2

5. On the electron-transfer view, an oxidising agent is a species that [1]

(a) accepts electrons and is itself reduced

(b) donates electrons and is itself oxidised

(c) accepts electrons and is itself oxidised

(d) donates electrons and is itself reduced

6. No indicator is added when $KMnO_4$ is used as the titrant in a redox titration, but one is needed with $K_2Cr_2O_7$. Explain, naming that indicator. [2]

7. Find the oxidation number of chlorine in (i) HOCl and (ii) Cl_2O_7. Why is it positive in both? [2]

8. Ammonia is formed from its elements: $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$. No ions are formed, yet the reaction is called a redox reaction. Explain, with oxidation numbers. [2]

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9. A student classifies three reactions as follows: (i) $2Ag_2O(s) \rightarrow 4Ag(s) + O_2(g)$, a redox decomposition; (ii) $2Al(s) + 6HCl(aq) \rightarrow 2AlCl_3(aq) + 3H_2(g)$, a metal displacement; (iii) $Cl_2(g) + 2KBr(aq) \rightarrow 2KCl(aq) + Br_2(l)$, a disproportionation, since one halogen is oxidised and the other reduced. Using oxidation numbers, say whether each classification is right, and correct any that is wrong. [3]

10. In basic solution, iodate oxidises chromium(III) hydroxide to chromate: $Cr(OH)_3(s) + IO_3^-(aq) \rightarrow CrO_4^{2-}(aq) + I^-(aq)$. Balance the equation by the half reaction method. [3]

11. Aluminium burns in sulphur vapour: $2Al(s) + 3S(s) \rightarrow Al_2S_3(s)$. Write the two half reactions, and name the oxidising agent and the reducing agent. [3]

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