

Chemistry 30

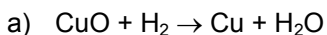
Unit 6: Redox Reactions and Electrochemistry

Assignment 1 Redox Reactions and Oxidation Numbers

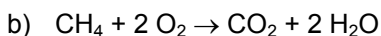
1. Define oxidation and reduction.
2. Determine the oxidation number of nitrogen in each of the following compounds:
 - a. NH_3
 - b. NO_2
 - c. Ca_3N_2
 - d. NI_3
3. Determine the oxidation numbers of the underlined element in the following compounds:
 - a. $\underline{\text{S}}\text{O}_2$
 - b. $\underline{\text{Mn}}\text{O}_2$
 - c. $\underline{\text{Cr}}^{3+}$
 - d. $\underline{\text{S}}\text{O}_4^{2-}$
 - e. $\text{H}_3\underline{\text{B}}\text{O}_3$
 - f. $\text{Na}_2\underline{\text{O}}_2$ (sodium *peroxide*)
 - g. $\underline{\text{Sn}}$
 - h. $\text{K}_2\underline{\text{Cr}}_2\text{O}_7$
4. Determine the oxidation of each element in $(\text{NH}_4)_2\text{CO}_3$
5. The following reactions are not complete reactions. Determine if each of the following changes is an oxidation, a reduction, or neither:
 - (a) $\text{SO}_3^{2-} \rightarrow \text{SO}_4^{2-}$
 - (b) $\text{CaO} \rightarrow \text{Ca}$
 - (c) $\text{CrO}_4^{2-} \rightarrow \text{Cr}_2\text{O}_7^{2-}$
 - (d) $2 \text{I}^- \rightarrow \text{I}_2$

Name: _____

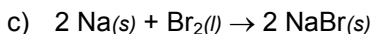
6. For each of the following reactions, complete the summary table below the equation. If an element does not undergo any change, leave the last two columns blank. Also provide the formula of the oxidizing or reducing agent. An example is shown.



element	Initial Ox. No		Final Ox. No.	e ⁻ gained or lost	Oxidized or reduced	Oxidizing or Reducing Agent
Cu	+2	→	0	gain 2	reduced	oxidizing agent - CuO
O		→				
H		→				



element	Initial Ox. No		Final Ox. No.	e ⁻ gained or lost	Oxidized or reduced	Agent
C		→				
H		→				
O		→				



element	Initial Ox. No		Final Ox. No.	e ⁻ gained or lost	Oxidized or reduced	Agent
Na		→				
Br		→				

7. Not all of the following reactions are redox reactions. Place a check mark in the appropriate column for each reaction.

	Redox	Not Redox
a. $\text{Na}_2\text{S}(aq) + \text{FeCl}_2(aq) \rightarrow 2 \text{NaCl}(aq) + \text{FeS}(s)$	_____	_____
b. $2 \text{Na}(s) + 2 \text{H}_2\text{O}(l) \rightarrow 2 \text{NaOH}(aq) + \text{H}_2(g)$	_____	_____
c. $2 \text{KClO}_3(s) \rightarrow 2 \text{KCl}(s) + 3 \text{O}_2(g)$	_____	_____
d. $\text{SO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_3$	_____	_____
e. $2 \text{Al} + 6 \text{HCl} \rightarrow 2 \text{AlCl}_3 + 3 \text{H}_2$	_____	_____