

Name: _____

Date: _____

Unit 11 - Topic 1

RedOx Reaction Skills (Review)

Chlorine has several possible oxidation states (-1, 0, +1, +3, +5, +7). Assign the proper state to Cl in each situation below:

1. Cl_2 Cl =
2. FeCl_3 Cl = Fe =
3. NaClO_2 Cl = Na = O =
4. NaClO_4 Cl = Na = O =

Nitrogen is the most complex element there is, having nine possible oxidation states (-3, -2, -1, 0, +1, +2, +3, +4, +5). Assign oxidation states to each type of atom in each substance.

5. NH_3 N = H =
6. N_2 N =
7. NaNO_3 N = Na = O =
8. $\text{Ca}(\text{NO}_2)_2$ N = Ca = O =

Balance each reaction. Classify each reaction. Decide if it is a REDOX reaction (yes or no).

9. ____ Al + ____ $\text{Cu}(\text{NO}_3)_2$ → ____ Cu + ____ $\text{Al}(\text{NO}_3)_3$ _____
10. ____ H_3PO_4 + ____ KOH → ____ H_2O + ____ K_3PO_4 _____
11. ____ CH_4 + ____ O_2 → ____ CO_2 + ____ H_2O _____
12. ____ CaCO_3 → ____ CaO + ____ CO_2 _____

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13. Which change occurs when a Sn^{+2} ion is oxidized to Sn^{+4} ?

1. two electrons are lost
2. two electrons are gained
3. two protons are lost
4. two protons are gained

14. When a substance is oxidized, it

1. loses protons
2. gains protons
3. loses electrons
4. gains electrons

15. Given the reaction: $2\text{Na}_{(s)} + 2\text{H}_2\text{O}_{(l)} \rightarrow 2\text{NaOH}_{(aq)} + \text{H}_{2(g)}$ Which substance undergoes oxidation?

1. Na
2. NaOH
3. H_2
4. H_2O

16. In any redox reaction, the substance that undergoes reduction will _____ (*lose or gain?*) electrons and as a result the value of the oxidation number will _____ (*increase or decrease?*).

For the following redox reactions, identify the species that is oxidized and the species that is reduced.

