

Key:

Chapter 25

VOCABULARY REVIEW

In the space at the left, write the term that correctly completes each statement.

- ~~free element~~
- ~~half-reactions~~
- ~~monatomic~~
- ~~oxidation~~
- ~~oxidation number~~
- ~~oxidation reaction~~
- ~~oxidation-reduction reaction~~

- ~~oxidized~~
- ~~oxidizing agent~~
- ~~redox~~
- ~~reduced~~
- ~~reducing agent~~
- ~~reduction~~
- ~~reduction reaction~~

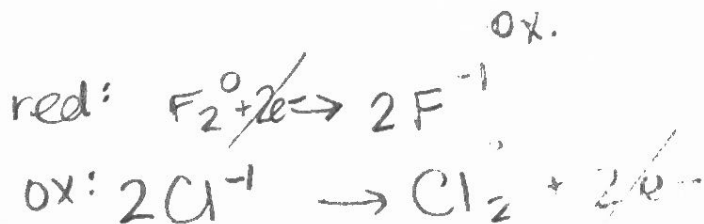
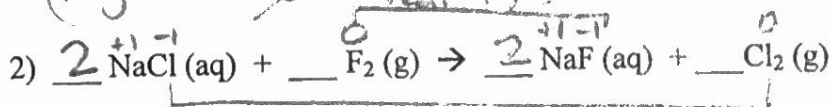
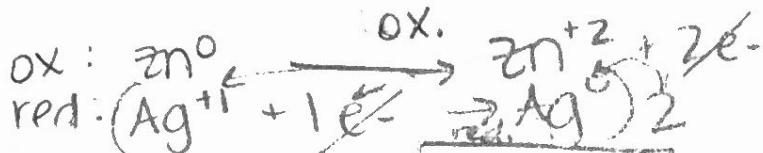
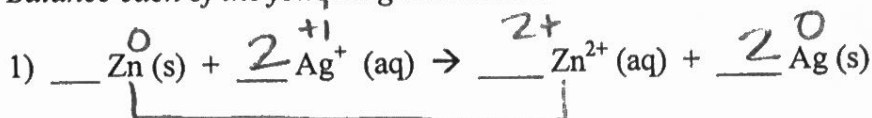
OIL R

- reducing agent 1. The ___ in a chemical reaction contains the atoms that are oxidized; it is the substance that gives up electrons.
- oxidation-reduction rxn 2. In a(n) ___, ions or atoms undergo changes in electronic structure.
- monatomic 3. ___ ions have oxidation numbers equal to their charge.
- reduction 4. ___ is the process by which electrons are gained by atoms or ions.
- oxidizing agent 5. The ___ is the substance in a reaction that gains electrons.
- oxidation 6. ___ is currently defined as the loss of electrons from an atom or ion.
- half reactions 7. Balancing complex redox equations may be more easily accomplished by expressing the oxidation and reduction processes separately as ___.
- oxidation # 8. The ___ is the charge an atom appears to have when electrons are assigned to it according to certain rules.
- reduced 9. A substance that has a change in oxidation number from 3+ to 0 is said to have been ___.
- oxidation rxn 10. The reaction $K \rightarrow K^+ + e^-$ is an example of a(n) ___.
- redox 11. The term ___ is another name for an oxidation-reduction reaction.
- oxidized 12. A substance that has a change in oxidation number from 1+ to 2+ is said to have been ___.
- reduction rxn 13. The reaction $I_2 + 2e^- \rightarrow 2I^-$ is an example of a(n) ___.
- free element 14. The atoms of a(n) ___ generally have an oxidation number of zero.

Complete the table below for each of the following reactions.

Reaction	Element Oxidized	Element Reduced	Oxidizing Agent	Reducing Agent	Total e ⁻ transferred
$ \begin{array}{c} \text{red} \\ \text{+1 -1} \quad 0 \quad \text{+1 -1} \quad 0 \\ 2 \text{HBr} + \text{Cl}_2 \rightarrow 2 \text{HCl} + \text{Br}_2 \\ \text{ox.} \end{array} $	Br	Cl ₂	Cl ₂	Br	2e ⁻
$ \begin{array}{c} \text{red} \\ 0 \quad 0 \quad \text{+2 -1} \\ \text{Zn} + \text{I}_2 \rightarrow \text{ZnI}_2 \\ \text{ox} \end{array} $	Zn	I ₂	I ₂	Zn	2e ⁻

Balance each of the following redox reactions.



Write T for true or F for false.

- F 1. Oxidation can occur without reduction taking place.
- T 2. In most compounds, the oxidation number of hydrogen is 1+.
- F 3. A substance has been oxidized when it gains electrons. *LOP*
- T 4. The oxidation number of a free element, such as O₂ or Fe, is zero.
- F 5. Oxygen atoms must be present if oxidation is to occur.
- T 6. A substance has been reduced when it gains electrons, which results in a reduction of its oxidation number. *LOP*
- F 7. In most compounds, the oxidation number of oxygen is 2+. *2-*
- T 8. A half-reaction is an equation that represents either the oxidation or reduction in a reaction.
- F 9. An oxidizing agent is a substance in a reaction that loses electrons. *reducing*
- T 10. The oxidation numbers of Group 1 (IA) and 2 (IIA) are numerically equal to the group number. *LOP*