

Definitions: Oxidation Reduction

1. Scientific processes are often defined **operationally** and / or **theoretically**.

Consider the statements below:

1	A chemical reaction between oxygen and some other substance
2	A chemical reaction that allows electrons to be gained
3	A chemical reaction where a metal is extracted from an ore
4	A chemical reaction that allows electrons to be lost

The operational definition of oxidation is given in statement ____ while the theoretical definition of reduction is given in statement _____

a	3	4
b	3	2
c	1	3
d	1	2

2. Scientific processes are often defined **operationally** and / or **theoretically**.

Consider the statements below:

1	A chemical reaction between oxygen and some other substance
2	A chemical reaction that allows electrons to be gained
3	A chemical reaction where a metal is extracted from an ore
4	A chemical reaction that allows electrons to be lost

The operational definition of reduction is given in statement ____ while the theoretical definition of reduction is given in statement _____

a	3	2
b	1	4
c	2	3
d	4	1

3. Scientific processes are often defined **operationally** and / or **theoretically**.

Consider the statements below:

1	A chemical reaction between oxygen and some other substance
2	A chemical reaction that allows electrons to be gained
3	A chemical reaction where a metal is extracted from an ore
4	A chemical reaction that allows electrons to be lost

The theoretical definition of oxidation is given in statement ____ while the operational definition of reduction is given in statement _____

a	2	1
b	4	3
c	2	3
d	4	1

4. Reducing agents are _____

a	Usually positively charged
b	Able to spontaneously react with Li(s)
c	Able to lose electrons
d	Easily reduced

5. Reduction potentials are a measure of the tendency of a(n) _____ agent to ____ electrons.

a	Reducing	Lose
b	Reducing	Gain
c	Oxidizing	Lose
d	Oxidizing	Gain

6. Oxidation potentials are a measure of the tendency of a(n) _____ agent to ____ electrons.

a	Reducing	Lose
b	Reducing	Gain
c	Oxidizing	Lose
d	Oxidizing	Gain

7. Which statement is true of a substance with an **oxidation potential** of 2.52 V?

a	It is a weak reducing agent
b	It is a strong reducing agent
c	It is a strong oxidizing agent.
d	It is a reagent capable of disproportionation.

8. Reduction is indicated by a

a	loss of electrons
b	decrease in oxidation number
c	positive ion becoming more positively charged
d	negative ion becoming neutrally charged

9. An electrolytic cell is one in which the _____

a	net potential of the reaction is positive
b	oxidation-reduction reaction is spontaneous
c	energy is converted from electrical to chemical
d	energy is converted from chemical to electrical

10. Up to 25% of the yearly production of iron is used to replace iron objects that must be discarded because of corrosion. The corrosion of iron is caused mainly by _____

a	an electrolytic process
b	A Voltaic process
c	a reaction between iron and air only
d	an endothermic neutralization process

11. A substance that loses electrons is _____

a	found at the cathode
b	the oxidizing agent
c	undergoing reduction
d	undergoing oxidation

12. When a substance undergoes oxidation, it always _____

a	Loses electrons
b	Decreases its oxidation number
c	Becomes positively charged
d	Attains a charge of zero

13. **Numerical response question:** Left justify your answer in the boxes provided.

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Consider the four statements listed below

1	Gold ions gain $3 e^-$ to become Au(s)
2	Zinc forms zinc ions by losing $2e^-$
3	The oxidation number of nickel changes from 0 to 2^+
4	The oxidation number of chromium changes from 6^+ to 3^+

- Choose all the statements that apply to an oxidation reaction.
- List the number(s) in ascending order

14. **Numerical response question:** Left justify your answer in the boxes provided.

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Consider the numbered statements below:

1	Cr^{3+} forms Cr^{2+}
2	A piece of iron metal rusts
3	Chloride ions are converted to chlorine molecules
4	Magnesium atoms are converted to magnesium ions
5	Zinc ions gain electrons
6	Oxidation number of lead goes from +4 to +2

- List all the statements above that describe an oxidation reaction.
- List the answer(s) in ascending order.

Solutions:

1. D
2. A
3. B
4. C
5. D
6. A
7. B
8. B
9. C
10. B
11. D
12. A
13. 23
14. 156