

# What are Ions and Ionization?

## Worksheet

An ion is an atom or molecule that has lost or gained one or more electrons, giving it a net electrical charge. Ionization is the process by which atoms become ions.

## Questions

1. Which process creates an ion from a neutral atom?  
A) Combustion  
B) Ionization  
C) Oxidation  
D) Reduction
2. An atom loses 2 electrons. Is the resulting ion positive or negative?  
A) Negative  
B) Positive  
C) Neutral  
D) Depends on the atom
3. How many protons are in an Fe ion if neutral iron has 26 protons?  
A) 23  
B) 26  
C) 29  
D) 3
4. Which requires energy: ionization or neutralization?  
A) Neutralization  
B) Ionization  
C) Both equally  
D) Neither
5. A sodium atom (Na) loses one electron. What ion is formed?
6. A chlorine atom (Cl) gains one electron. What ion forms?
7. An oxygen atom gains 2 electrons. How many electrons does the O ion have?
8. Define: What is an ion?
9. Define: What is ionization?
10. Define: Can ionization happen to molecules?

## Answer Key

1. B) Ionization - Ionization is the process of gaining or losing electrons to form an ion.
2. B) Positive - Losing electrons removes negative charge, leaving net positive cation.
3. B) 26 - Ionization changes electron count, not protons. Fe still has 26 protons.
4. B) Ionization - Ionization requires energy to separate electrons; neutralization releases energy.
5. Sodium: 11 protons, 11 electrons (neutral) Loses 1 electron Remains: 11 protons, 10 electrons Net charge: +1 Na cation
6. Chlorine: 17 protons, 17 electrons (neutral) Gains 1 electron Becomes: 17 protons, 18 electrons Net charge: -1 Cl anion
7. Oxygen: 8 protons, 8 electrons (neutral) Gains 2 electrons O: 8 protons, 10 electrons
8. An atom or molecule that has gained or lost electrons, giving it a net electrical charge.
9. The process by which a neutral atom or molecule becomes an ion by gaining or losing electrons.
10. Yes - molecules can also be ionized (e.g., HO, OH).

### **Bounlu**

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