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## 1. General Information

- Symbol: Ne
- Atomic Number: 10
- Atomic Mass: 20.180 u
- Group: 18 (Noble Gases)
- Period: 2
- Block: p-block
- Electron Configuration:  $1s^2 2s^2 2p^6$
- Valence Electrons: 8 (Full outer shell)
- Phase at Room Temperature: Gas

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## 2. Isotopes of Neon

Isotope	Protons	Neutrons	Abundance	Notes
$^{20}\text{Ne}$	10	10	90.48%	Most abundant.
$^{21}\text{Ne}$	10	11	0.27%	Stable, trace amounts.
$^{22}\text{Ne}$	10	12	9.25%	Stable, second most abundant.

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### **3. Physical Properties**

- Color: Colorless (glows reddish-orange in electric discharge)
- Odor: Odorless
- Density: 0.9002 g/L (at STP)
- Melting Point: -248.6°C
- Boiling Point: -246.1°C
- State at STP: Gas
- Non-metallic and Monatomic: Exists as Ne atoms.

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### **4. Chemical Properties**

- Inert and Non-reactive – Does not easily form compounds.
- Stable Electron Configuration: Full outer electron shell.
- Non-flammable and non-toxic.
- No Known Stable Neon Compounds under normal conditions.

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### **5. Occurrence and Abundance**

- Fifth most abundant element in the universe.
- On Earth:
  - Atmosphere: 0.0018% by volume.
  - Crust: Trace amounts.
  - Stars and Solar Wind: Produced by stellar nucleosynthesis.
- Extracted by fractional distillation of liquefied air.

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### **6. Industrial Production of Neon**

- Method:

- Fractional distillation of liquid air (Neon is separated from other noble gases and nitrogen).
- Source Material: Atmosphere.

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## 7. Uses of Neon

Application	Description
Neon Signs	Glows reddish-orange in electric discharge.
High-voltage Indicators	Neon is used in indicator lights.
Television Tubes	Used in gas discharge tubes for displays.
Lasers	Neon gas is part of helium-neon (HeNe) lasers.
Cryogenics	Liquid neon is used as a cryogenic refrigerant.
Scientific Research	Used in vacuum tubes and high-energy physics.

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## 8. Neon in Lighting

- Color Emission:
  - Glows reddish-orange in low-pressure discharge tubes.
  - Different gases (e.g., argon, helium) produce different colors.
- Neon Lights:
  - Often mixed with argon or mercury to produce other colors.
  - Pure neon glows red, while argon glows blue or purple.

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## 9. Biological Role of Neon

- Non-toxic and Biologically Inert: Neon has no biological role.
- Inhalation: Safe to inhale in small amounts but displaces oxygen in confined spaces.

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## 10. Safety and Hazards

- Non-reactive and Non-flammable.
- Asphyxiation Hazard: Can displace oxygen in confined spaces, leading to suffocation.
- Stored as a Compressed Gas: Handle under high pressure with care.

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### Fun Facts About Neon:

- Discovered in 1898 by William Ramsay and Morris Travers.
- Neon signs were first introduced in 1910 by Georges Claude.
- Neon is rare on Earth but abundant in the universe and stars.
- The term “neon lights” is often used for all gas discharge tubes, even if they use gases other than neon.