



## Phosphorus Chemical Symbol "P" Atomic Number 15

Phosphorus belongs to the chemical elements in Group 15 that is called as Pnictogens family. Antimony, Bismuth, Nitrogen and arsenic are other members of group XV of the periodic table. This group of chemical elements is also known as group 5A. The periodic table is common and useful for chemists, researchers and scientists to understand common behaviors of elements in group because of the rationalized arrangements of the chemical elements. It also helps in recognizing the differences among the chemical elements of other groups.

### **Occurrence of Phosphorus**

Phosphorus is abundant pnictogen element that resides in the earth's crust in the forms of various minerals. It is not free in the nature. It is found in deposits and rocks mainly known as phosphates. These phosphate rocks are termed as minerals. The inorganic phosphate rock that is usually made up of "apatite" is mainly huge source of phosphorus. The large deposits of phosphorus are found in American, Russia, China and Morocco. The different organic sources of phosphorus are urine, guano and bone ash too.

**Physical Properties of Phosphorus:** Phosphorus is a white solid that is seems similar to a wax. Phosphorus gives greenish white glowing color in the dark when it is exposed in the open air and is very poisonous at that time. Phosphorus does not dissolve in the water easily but through much difficulty it can be dissolved. The red phosphorus is a powder that can easily change its color from orange to violet. We cannot dissolve this powder in the liquid because of its chemical arrangement. The black phosphorus is formed under high pressures and it almost looks like a graphite powder. Black phosphorus also has the capability to conduct the electricity.



# Phosphorous

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## Alloying Behavior of Phosphorus

Phosphorus copper alloy is used in the form of deoxidant i.e. a method to remove oxygen during any steel manufacturing. It is also an important alloying agent and a wetting agent too in brazing rods. Phosphides also work as nucleant for the industries of aluminum i.e. it initiates nucleation in other particles.

*Minor Phosphorous percentage is used in alloying of various different grades of steels. Some are AISI 316 stainless steel, 1.4301 austenite stainless steel, C45 medium carbon steel etc.*

**Chemical Properties of Phosphorus:** The white form of phosphorus is highly chemically active. The other allotropes of phosphorous i.e. black and red state. The red state is more stable than the white state and is used in matchsticks since it is flammable. Black phosphorus is the most stable form. Phosphorus can react with all types of halogens and form different phosphorous halides. When red phosphorous is heated with any metal it turns into phosphides.