

# White Phosphorous

**Problem:** Accurate Analysis of White Phosphorous at Low Levels

**Solution:** DataChem can provide quick, accurate low-Level Analysis of White Phosphorous:

- ◆ Analysis by Method 7580 using gas chromatography
- ◆ Flame photometric detection (FPD): a selective detector for phosphorous
- ◆ Routinely used for federal programs
- ◆ Low PQLs
- ◆ Rapid turnaround times available
- ◆ LC/MS Confirmation available

EPA  
7580  
GC

Limits in Water (7580):	Practical Quantitation Limit (LOQ):	0.05 µg/L
Limits in Soil (7580):	Practical Quantitation Limit (LOQ):	0.5 µg/Kg
Sampling Requirements:	Volume:	500 mL (water) 4 oz (soil)
	Container:	500 mL Amber glass (water) 4 oz Amber (soil)
	Preservative:	4°C

Keep out of sunlight as much as possible

DataChem Laboratories, Inc.  
960 West LeVoy Drive  
Salt Lake City, UT 84123

1-800-356-9135—toll free  
1-801-266-7700  
Fax: 1-801-268-9992

marketing@datachem.com  
www.datachem.com

**For a complete list of our services,  
visit us at [www.datachem.com](http://www.datachem.com)**

# White Phosphorous

White phosphorus is a colorless, white, or yellow waxy solid with a garlic-like odor. It does not occur naturally, but is manufactured from phosphate deposits. White phosphorus reacts rapidly with oxygen, easily catching fire at temperatures 10 to 15 degrees above room temperature.

White phosphorus is used by the military in various types of ammunition, and to produce smoke for concealing targets and troop movements. It is also used by industry to produce phosphoric acid and other chemicals for use in fertilizers, food additives, and cleaning compounds. Small amounts of white phosphorus were used in the past in pesticides and fireworks.

There are no studies available that suggest white phosphorus causes cancer, however the EPA has listed white phosphorus as a Hazardous Air Pollutant. The EPA also states that white phosphorus is extremely toxic to humans. Acute exposure to high levels in humans is characterized by three stages: the first stage consists of gastrointestinal effects; the second stage is symptom-free and lasts about two days; the third stage consists of gastrointestinal effects, plus effects on the kidneys, liver and cardiovascular system. Chronic exposure results in necrosis of the jaw, termed "phossy jaw". Dermal exposure to white phosphorus may result in severe burns.

The effects of ingestion are extremely unpleasant. Symptoms begin with severe irritation of the gastrointestinal tract, accompanied by severe vomiting and loss of mucosal surfaces of the stomach and intestine. The liver and kidneys will also be affected, leading to severe jaundice. Death can follow after several days.

White phosphorus can enter the environment during production, when used in manufacturing, by the military, or accidentally spilled during transport and storage. It can be found in the water and bottom sediment of rivers and lakes near facilities that make or use it. In the air, white phosphorus reacts rapidly with oxygen to produce relatively harmless chemicals within minutes, In water, white phosphorus reacts with oxygen within hours or days. In water with low oxygen, white phosphorus may degrade to phosphine, a highly toxic compound. In deep soil or sediments with little oxygen, white phosphorus may remain unchanged for many years.

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[www.datachem.com](http://www.datachem.com)

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1-801-266-7700  
Fax: 1-801-268-9992  
[marketing@datachem.com](mailto:marketing@datachem.com)

