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Phosphorus

- It's a not metallic irritant poison.
- Two types
 1. Yellow (white) phosphorus
 2. Red phosphorus

Physical Appearance

S.No.	Trait	White phosphorus	Red Phosphorus
1.	Color	White. Yellow (when impure)	Reddish brown
2.	Appearance	Translucent, waxy paste	Amorphous, solid mass
3.	Smell and taste	Garlic like	Odorless and tasteless
4.	Luminosity	Luminesces in the dark (poisoning results in luminescent vomit and stools)	Non-luminous
5.	Exposure to air	Pyrophoric (self-igniting). Ignites spontaneously at 34°C. Must be kept under water.	Does not ignite spontaneously.
6.	Use	Rat baits, fireworks, fertilizers	On the side of modern matchboxes (along with powdered glass)
7.	Toxicity	Highly toxic	Non-toxic

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- Mode of action:
 - Yellow phosphorous – A protoplasmic poison.... a potent hepatotoxin that uncoupling the oxidative phosphorylation and decreasing the ATP level in the hepatocyte.
 - Large doses lead to shock and CV collapse.
 - Locally, it produces severe irritation of skin and mucosa.

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- Clinical features
 - A. Fulminant poisoning:
 - On massive dosemore than 2 grams.
 - Vomiting, diarrhea, peripheral vascular collapse.
 - Death within 12 to 24 hours

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B. Acute poisoning –

- Three stages

1. First stage (up to the first 3 days)

- Local effects – vomiting, diarrhea, burning pain
- Breath smells of garlic.
- Luminous stool and vomit.
- Smoky stool syndrome.

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2. Second stage – (next four days)
 - Symptoms free period.
 - Should not be discharged.

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3. Third stage (next 2 days)

- Systemic involvement after absorption.
- Severity increased with digestive symptoms.
- Liver injury – tender hepatomegaly, jaundice, hepatic encephalopathy, stupor and coma.
- Mousy odour to breath (feotor hepaticus).
- Flapping tremor of hands.
- Renal injury – oliguria, hematuria and ARF.

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C. Chronic poisoning –

- Long term exposure to phosphorus fumes by the occupational workers may have poisoning by absorption through carious tooth which develops unusual mandibular osteonecrosis (Phossy Jaw / Lucifer Jaw / Glass Jaw) , sequestration and osteomyelitis of jaw

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- Treatment
 - Gastric lavage with potassium permanganate (1:5000).
 - Vitamin K IV drip (65 mg) slowly
 - IV fluids
 - Whole blood or fresh frozen plasma to correct coagulation defects.
 - Inotropic support.
 - Local dermal burns can be treated with water or copper sulphate solution (1%) with soft paraffin.

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- Forensic Significance
 1. Accidental poisoning – matches/fireworks
 2. Suicidal poisoning – lucifer matchstick head mixes in coffee, brandy etc.
 3. Homicidal poisoning – lucifer matchstick.