

	TRACE-PM 10.18 Red Phosphorus and Iodine Identification	
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10.18 Red Phosphorus and Iodine Identification

10.18.1 Red Phosphorus and Iodine Analysis of Powders

This is designed for the guidance of laboratory personnel who support investigations of clandestine drug laboratories by analyzing non-drug samples for the presence of chemical reagents used in the illegal manufacture of controlled substances. The scope is limited to chemicals most frequently encountered in the illegal manufacture of controlled substances, namely, red phosphorus and iodine.

10.18.1.1

1) Note appearance. Red phosphorous has a dark red color and can be a fine powder, a chunky powder or a gummy material. Iodine has a black/dark purple color and is usually a fine powder that causes plastic and paper surfaces it touches to turn yellow.

10.18.1.2

2) For suspected red phosphorous, mix a small sample of material with an equal amount of potassium perchlorate or potassium chlorate (oxidizers). Place mixture on a hard metal surface and strike with a hammer. A report with flash is a preliminary positive result for red phosphorous (fuel). If test is negative, sample can be washed with methanol, methylene chloride and/or acetone and the test repeated.

10.18.1.3

3) For suspected iodine, place a small amount of sample on a glass slide and heat on a hotplate. The sample sublimating as a purple gas is a preliminary positive result for iodine.

10.18.1.4

4) Prepare sample for SEM/EDS analysis. For suspected iodine, since it is volatile, first convert it to the silver salt by adding a few drops of silver nitrate to a small amount of sample on a glass slide or watch glass, and dry on a hotplate. For suspected red phosphorous, if it is gummy or wet, dry on a hotplate.

10.18.1.5

5) Analyze sample on the Scanning Electron Microscope/Energy Dispersive X-ray Spectrometer (SEM /EDS). Mount a sample of the dried silver salt (iodine) or the sample or dried sample (red phosphorous) on an SEM stub. Identify the phosphorous and/or the iodine by their x-ray energy profiles.

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10.18.2 Red Phosphorus and Iodine Analysis of Liquids

10.18.2.1

If dark red material is floating in the liquid or sitting at the bottom, remove by pipette, dry on a glass slide on a hotplate and analyze as described in 1 - 5 above.

10.18.2.2

Dry a few drops of the liquid without silver nitrate added on another slide and check for purple gas evolution.

10.18.2.3

To analyze the liquid itself, add a few drops of silver nitrate to a sample of the liquid on a glass slide or watch glass, and dry on a hotplate. Mount some of the residue on an SEM stub and analyze on the SEM/EDS, as above.

10.18.3 Safety Considerations

Follow guidelines of the FSD Health and Safety Manual.

Avoid contact with skin and eyes.

This protocol involves hazardous materials, operations, and equipment. This protocol does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this protocol to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Proper caution should be exercised and the use of personal protective equipment should be considered to avoid exposure to dangerous chemicals. Consult the appropriate MSDS for each chemical prior to use.

10.18.4 References

1) Microgram Bulletin, Vol. XXXVII, No. 2, Feb. 2004, Identification of Iodine and Red Phosphorus

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2) Journal of the Clandestine Laboratory Investigating Chemists Assoc., Vol. 5, No. 4, Oct. 1995, Analysis of Inorganic Components Found in Clandestine Drug Laboratory Evidence

3) Clandestine Laboratory Investigating Chemists Assoc. Training Seminar, Sept. 1998, Identification of Common Inorganic Acids Encountered at Clandestine Laboratories