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APPLICATION NOTE

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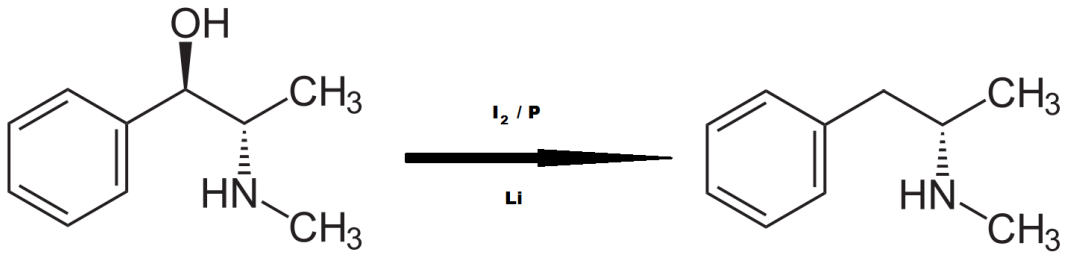
Identification of Clandestine Laboratory materials

A typical Clandestine Laboratory

Methamphetamine production and use has become a scourge of many countries worldwide. This in part is due to the ready availability of the pre-cursor chemicals for its manufacture. This makes it possible for small scale production in Clandestine Laboratories to be carried out.

Typical synthetic routes encountered involve reduction of the hydroxyl group in Ephedrine / Pseudoephedrine, commonly found in over the counter decongestants. The reduction can be facilitated by Hydroiodic (HI) that is generated from Iodine (I_2) , Water and Phosphorous (P). This is known as the red-phosphorous "cook" method. The other method, known as the birch method, involves using Lithium Metal and Ammonium Nitrate to facilitate the reduction. The reaction is shown below.



Lithium is typically obtained from Lithium batteries, and Phosphorous can found in flares, and match box striking plates. Iodine can be purchased from pharmacists/drug stores.

The identification of these chemicals recovered from suspect laboratories can provide useful evidence in proving illicit drug manufacture.

Here we show that the ECCO Elemental Composition Comparator can detect and identify lithium, phosphorous and iodine. Lithium with atomic number 3 is particularly difficult to detect by other analytical methods.

Lithium

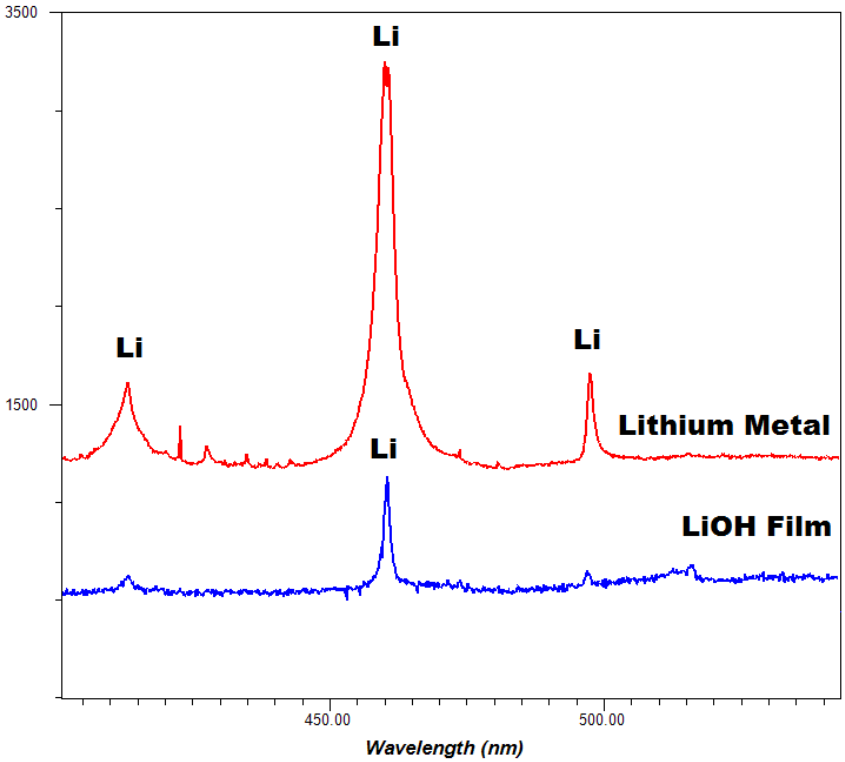


Figure 1 - Spectra of Lithium metal from a battery and a thin film of Lithium hydroxide. The line broadening is due to a combination of self-absorpion (for the bulk metal) and stark broadening.

Iodine

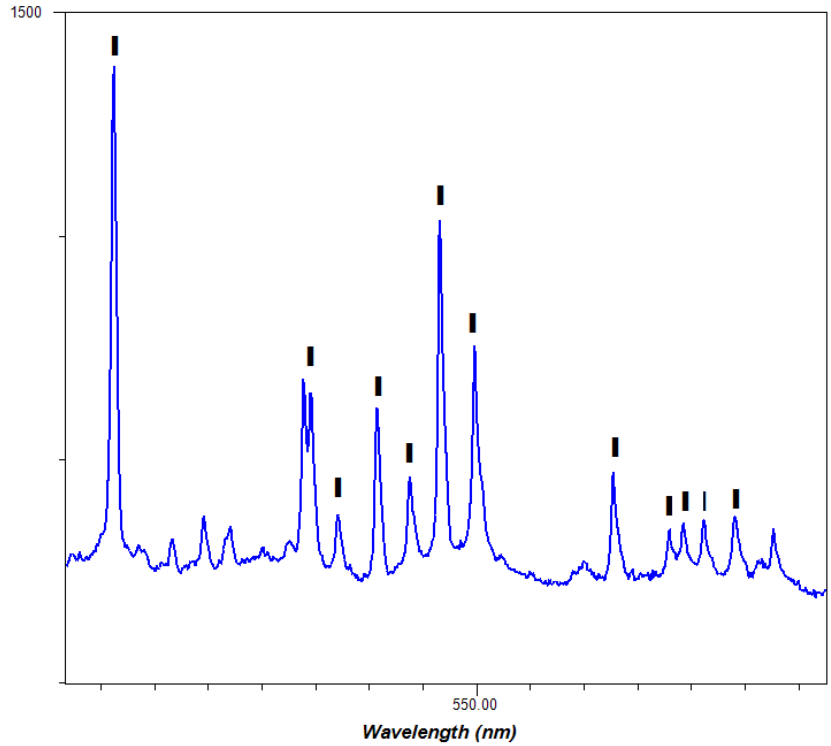


Figure 2 – solid Iodine shows a complex pattern of peaks in 500 – 560 nm range.

Phosphorous

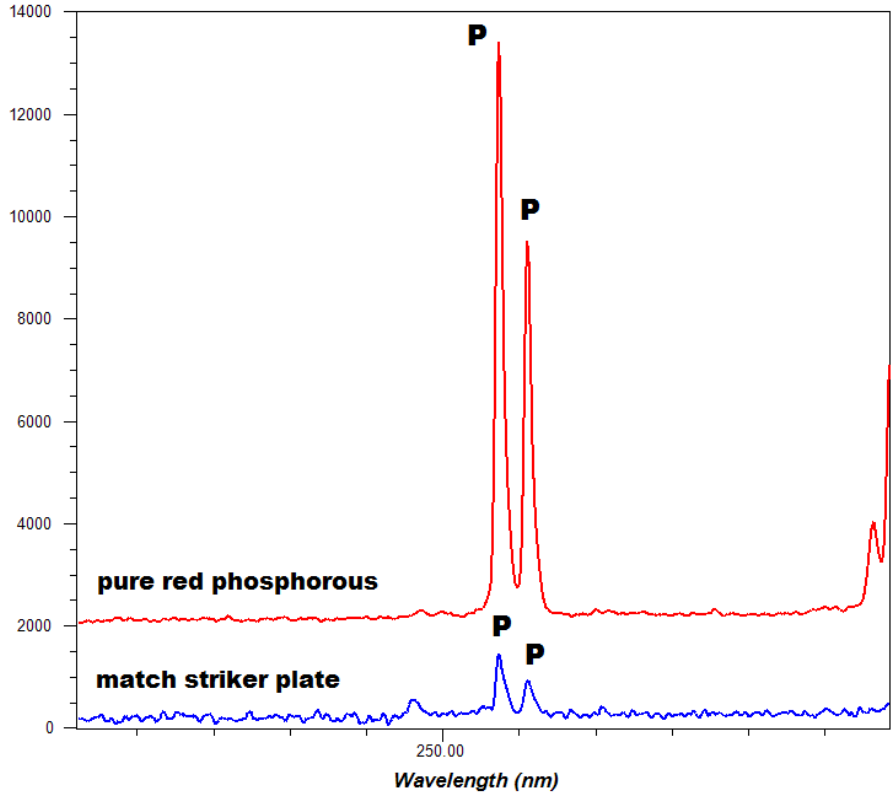


Figure 3 – Phosphorous shows a 2 prominent peaks in the UV spectral region, at 253.6 and 255.5 nm. The same peaks albeit weaker in intensity are visible in the spectrum of the match striker plate.

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