

# Meth Labs: The Gases Can Kill You

By David Kuiawa

The early morning sun is just about to break the horizon. It's 06:00, the wind is deadly calm, and the dim light dances across the frosty meadow; the only thing that stands between your team and an innocent looking farmhouse. However, this farmhouse is far from benign. You have received numerous complaints about strange smells wafting from the property, there is traffic coming and going at all hours of the night, and there is a small dump containing cold medicine bottles, modified propane tanks, solvent containers, and lithium battery skins. All of the evidence points to the existence of a small clandestine drug lab on the premises.

You have been in this situation before; the nervous feeling you harbor only serves to heighten your sense of alert. As you brief your team before the raid there are a thousand things racing through your mind. On the top of the list is a review of the hazards you may encounter. Most obvious are the physical ones. You've heard of everything from landmines, homemade bombs, and automatic weapons, to snakes, tigers, and rotweilers. The "tweakers" running this place will do everything they can to keep from getting caught.

And while the bullets, bombs, and booby traps are certainly a concern, there are also unseen gas hazards that can be even more deadly. A clandestine drug lab, or "clan lab" for short, is really a crude chemistry lab operated by people ranging in experience. Those designated to "cook" the product have backgrounds that vary from Chemical Engineers to "Junkies" just looking for the next high. The stability of the situation is highly unpredictable.

## Methamphetamine Labs

The most popular of all the clan labs are the ones that produce methamphetamine or "meth." Methamphetamine is a stimulant that is generally sold in a crystal or powder form. It is ingested or smoked and is highly addictive. Meth production is quite simple and highly profitable. The majority of the chemicals required to produce the stimulant are commonly available and the tools needed to conduct the cook are in just about everyone's house.

## "Nazi Dope" Method and Hazards

There are two main ways of cooking meth. The first method is called the "Nazi Dope" method and it is for small quantities production. This method is most popular for the manufacturer/user and it is very hard to produce distributable quantities this way.

The process starts with ephedrine or pseudoephedrine (over-the-counter cold medicine); the pills are then crushed and mixed with a common solvent such as acetone or lacquer thinner. This is done to free the ephedrine from the binder. The mixture is then filtered to leave the solvent/ephedrine mixture behind. The mixture is then allowed to sit so the solvent can evaporate leaving powdered ephedrine. This first stage of the process is highly volatile and the risk of explosion is elevated due to the free solvent vapors in the air.



The powdered ephedrine is then combined with lithium battery strips from disassembled batteries and anhydrous ammonia is added. The chemical reaction results in a material called meth oil. During the second stage of the process, toxic ammonia gas is present due to the uncontrolled use of liquid ammonia.

The next step of the process involves manufacturing a crude hydrogen chloride gas generator. This is accomplished by combining common acids and rock salt. The hydrogen chloride gas is then bubbled through the meth oil and meth crystals fall out of the solution. In the final stage of the process, deadly hydrogen chloride gas is present and poses a severe health risk.

## "RP Method and Hazards"

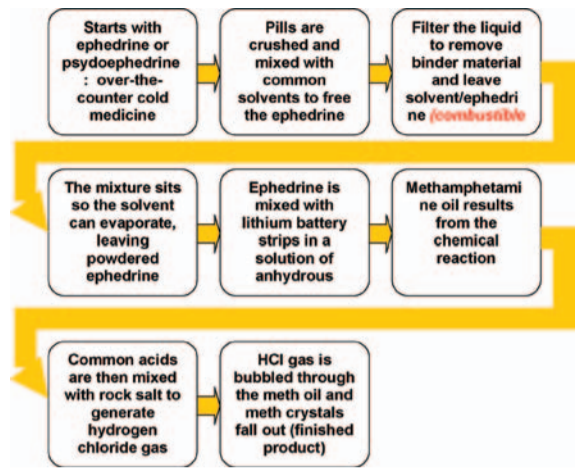
The second method for cooking meth is the Red Phosphorous or RP method. This method is designed to produce large quantities of meth but also produces large quantities of hazardous waste. The RP method is the technique used most by "super labs" which are often run by organized crime. The RP lab is a bit more sophisticated and controlled. It often has laboratory grade equipment and is staffed by chemists in order to maximize production and quality.

The RP process follows the same process as the Nazi Dope method and continues consistent until powdered ephedrine results. The powder is then mixed with red phosphorous (extracted from match packs and flare strikers) and iodine. The mixture immediately begins to produce hydriodic acid and toxic phosphine gas.

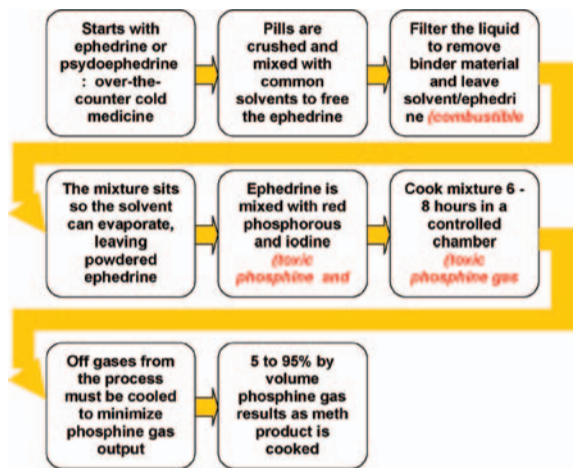
The mixture is heated in a controlled environment and the cook lasts 6 - 8 hours. During the process, the off-gases need to be cooled to minimize phosphine gas production, which will range anywhere from 5% to 95% by volume - extremely lethal concentrations.

## Firefighters Protecting Themselves

You should never consider entering a suspected chemical lab



Methamphetamine Manufacturing Processes and Hazards  
Nazi Dope Method: Manufacturing method of choice for small batches. Can be manufactured using common household items. Most common manufacturing method among user/manufacturers.



Red Phosphorous (Red P) Method: Manufacturing method of choice for large quantities production. Super labs use the RP method of manufacturing meth.

without a gas monitoring device that will quantify the levels of deadly toxic and explosive combustible gases. Until recently, however, the only technology available to monitor the phosphine, ammonia, and hydrogen chloride gases associated with meth labs were colorimetric indicator tubes. These glass tubes were cumbersome, took several minutes to react, and were grossly inaccurate.

Fortunately, we now have direct reading gas monitors with the capability of monitoring these five target gases simultaneously and continuously. And with lithium-ion battery technology that will run for 24 hours on a single charge and sampling pumps that can sample draw from a range of 100 feet, firefighters and HazMat teams can now also be effective while remaining at safe distances.

The new technology also means that firefighters can now play a vital role in evidence gathering since the ammonia, phosphine, hydrogen chloride, oxygen, and combustible gas monitors are also able to document who is using the monitor and where they are using it. Combine this with the capability to interface with automated calibration systems that control calibration, bump testing routines, and the timing of them; and the fact that routines can be documented on a PC to prove the accuracy of the monitor as well as produce printed certificates to confirm and validate evidence of the calibration, the data is now generally legally admissible, and supportive to the effort of reducing the clandestine drug lab hazard overall.

## Cut to the chase

Ultimately, the goal is increased safety. In this sometimes dirty business, where criminals are willing to break the law and jeopardize emergency responders with traps and hazards, firefighters should always be looking to new technology as a means of better protecting themselves from the hazards - especially from the five target gases associated with meth labs.

Dave Kuiawa is Sales Manager, North and South America for Industrial Scientific Corporation. He has been with ISC for 14 years serving in various capacities including Manager of Customer Services, Service Manager, and Sales and Training Coordinator. Dave may be contacted at (800) 358-3287.



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