

**General remarks:** Did the administering officer receive formal training on how to use the NarcoPouch? How many times did they administer the test, how frequently, and how confident are they with their ability to distinguish different color results?

**Cuajo:** is Rennet, which is a complex of enzymes produced by animals that ruminates, or digest plant matter by fermentation. Rennet is usually used to produce cheeses. Rennet can lead to a number of secondary amine fermentation byproducts when brought in contact with the right food material (reviews attached). These secondary amine byproducts would produce positive results in both the 902 and the 923 NarcoPouch tests.

**NarcoPouch Test 902:** is a **presumptive test** for alkaloids (including opioids and amphetamines) consisting of Marquis reagent.

**Marquis reagent:** This reagent is a mixture of concentrated sulfuric acid and formaldehyde. The test is color-based, and will change different colors when amines are present. This test will change color in the presence **many** primary, secondary, and tertiary amines through a chemical reaction with the formaldehyde. Other functional groups can also react. This can include a number of OTC medications, supplements, and other compounds.

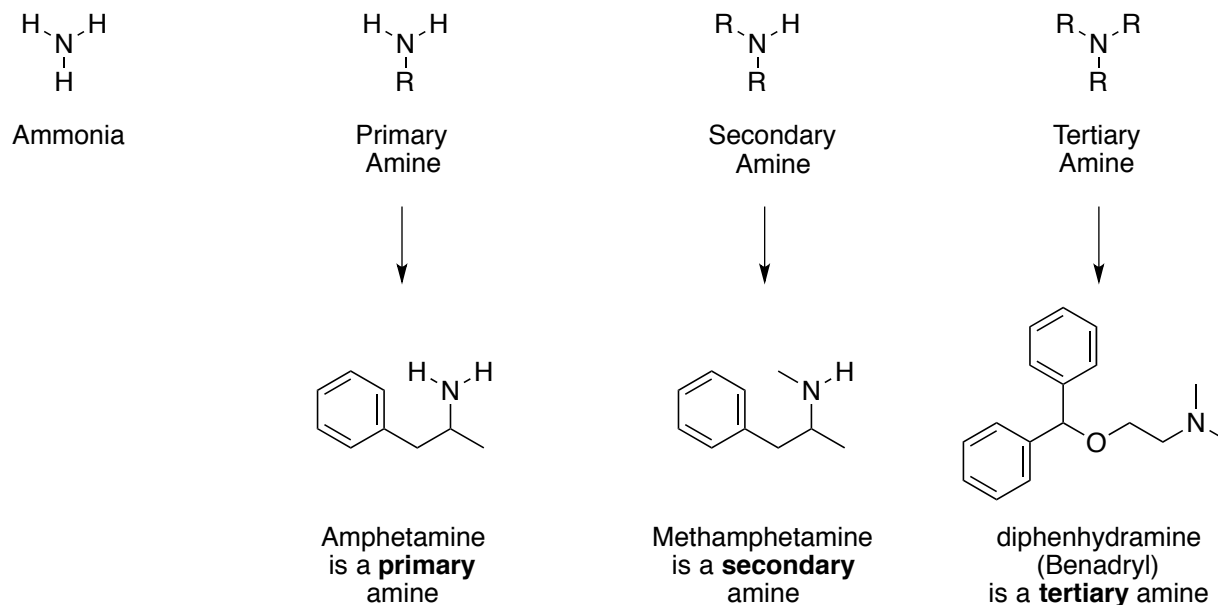
[https://erowid.org/chemicals/mdma/mdma\\_faq\\_testing\\_kits.shtml](https://erowid.org/chemicals/mdma/mdma_faq_testing_kits.shtml)

**NarcoPouch Test 923:** Is another **presumptive test**, but for **secondary amines**. Methamphetamine contains a secondary amine, but so do many other common compounds. These include proline, an amino acid and a dietary supplement, and spermidine, a fermentation byproduct that could arise from rennet coming in contact with an appropriate food source. This kit consists of sodium nitroprusside, acetaldehyde, and a carbonate base. The mechanism of the reaction is outlined below. The secondary amine reacts to form an iminium intermediate (not shown) that rapidly rearranges to form an enamine (**1**), which reacts with the nitroprusside (**2**) to form the nitroprusside adduct (**3**) that fragments to regenerate the amine and deliver the bright blue Simon-Awe complex (**4**) that is visualized.

[https://en.wikipedia.org/wiki/Simon%27s\\_reagent](https://en.wikipedia.org/wiki/Simon%27s_reagent)

### Amines explained:

Amines are ammonia derivatives. The nitrogen of amines can form up to three bonds with alkyl groups. Depending on the number of alkyl groups (1, 2, or 3), the amine is either primary, secondary or tertiary. Some examples are shown below.



A much more detailed explanation of amines can be found here:

<http://www.chemguide.co.uk/organicprops/amines/background.html>

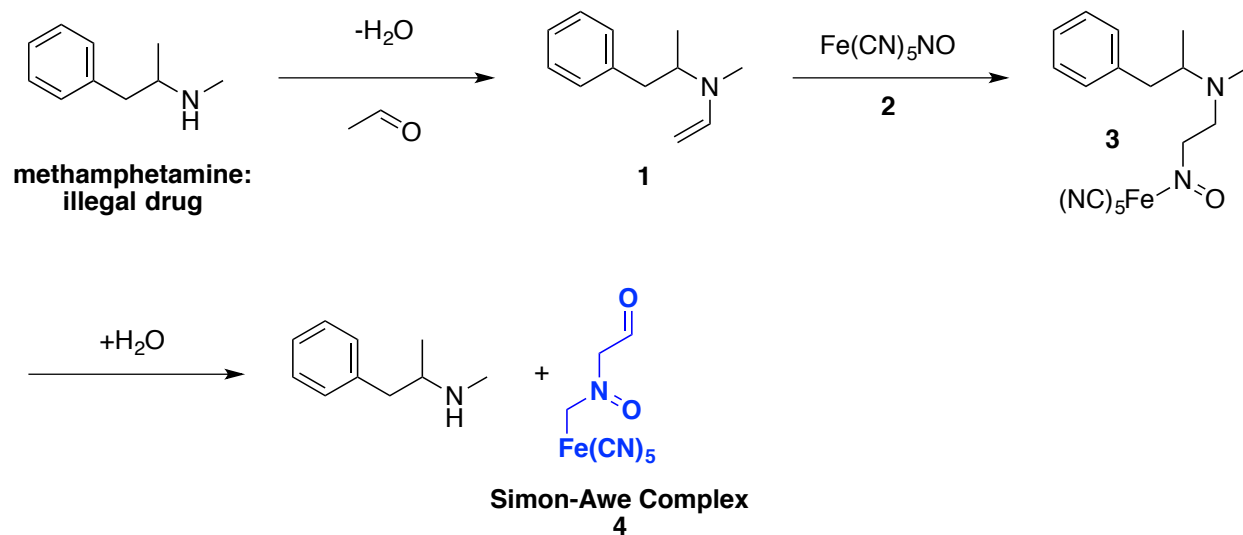
**Attachments:** I'm attaching a report containing information where NarcoPouches were used incorrectly. See pages 47-51.

I'm attaching "Idaho State Police Forensic Laboratory Training Manual." They mention that Benadryl (diphenhydramine) reacts to give "yellow" result while fentanyl and methamphetamine give an orange or brown color. I would argue those two colors are hard to distinguish and have a spectrum of ambiguity, especially since those colors would change in intensity depending on the concentration of the substance being tested.

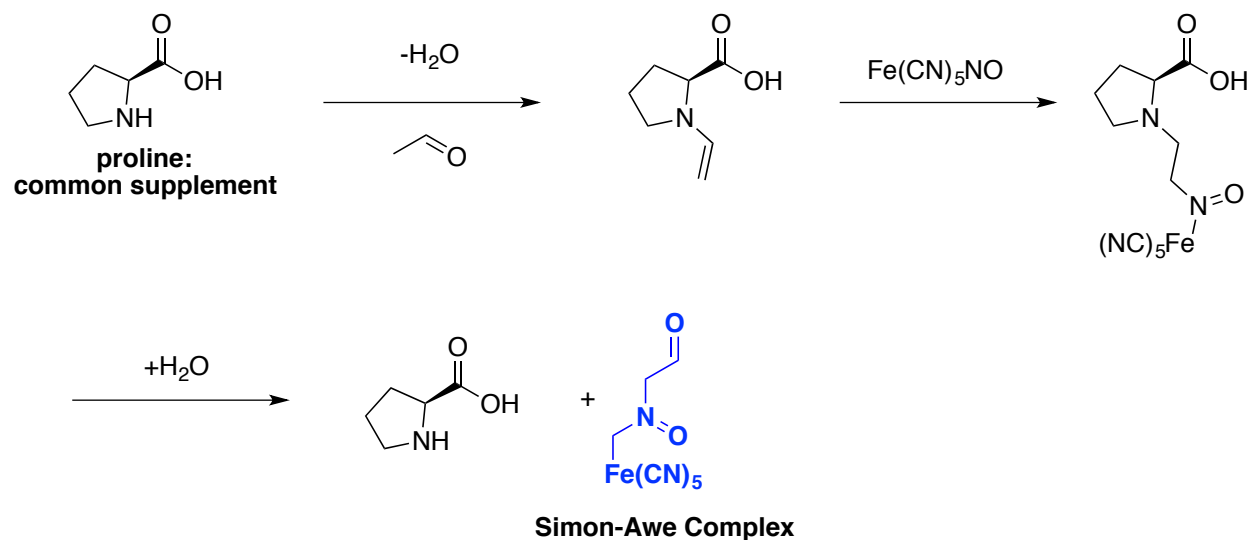
## Presumptive vs confirmatory tests:

<http://www.forensicsciencesimplified.org/drugs/principles.html>

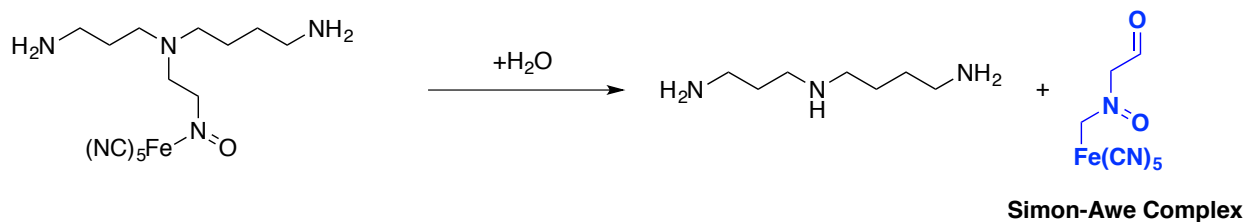
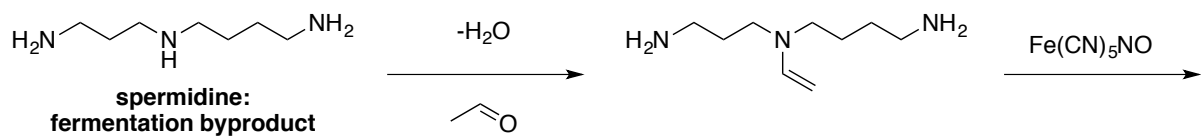
## Reaction Schemes of NarcoPouch 923 with Amphetamine, Proline, and Spermadine



This can also happen with other secondary amines, like proline, which is a common supplement



Or with spermidine, a common fermentation byproduct, which would come from rennet coming in contact with a fermentable material



All three reactions would lead to the same blue product depicted in the bottom right of each scheme.