



## Chemicals Required for the Illicit Manufacture of Drugs

1. A variety of chemicals are used in the illicit manufacture of drugs. The United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 (1988 Convention) refers to “substances frequently used in the illicit manufacture of narcotic drugs and psychotropic substances”.

Twenty-two such substances are listed in Tables I and II of the 1988 Convention as in force on 1st May, 1998. (See Table 1)

**Table 1  
SUBSTANCES IN  
TABLES I AND II OF  
THE 1988  
CONVENTION**

<b>Table I</b>	<b>Table II</b>
<i>N</i> -Acetylanthranilic acid.	Acetic anhydride
Ephedrine	Acetone
Ergometrine	Anthranilic acid
Ergotamine	Ethyl ether
Isosafrole	Hydrochloric acid*
Lysergic acid	Methyl ethyl ketone
3,4-methylenedioxyphenyl-2-propanone	Phenylacetic acid
1-phenyl-2-propanone	Piperidine
Piperonal	Potassium permanganate
Pseudoephedrine	Sulphuric acid*
Safrole	Toluene
The salts of the substances in this Table whenever the existence of such salts is possible.	The salts of the substances in this Table whenever the existence of such salts is possible.
* The salts of hydrochloric acid and sulphuric acid are specifically excluded from Table II.	

*Chemicals used in the illicit manufacture of narcotic drugs and psychotropic substances are often described as precursors or essential chemicals, and these include true precursors, solvents, oxidising agents and other substances.*

The term “precursor” is used to indicate any of these substances in the two Tables. Chemicals used in the illicit manufacture of narcotic drugs and psychotropic substances are often described as precursors or essential chemicals, and these include true precursors, solvents, oxidising agents and other substances. Although the term is not technically correct, it has become common practice to refer to all such substances as “precursors”.

*Chemicals manufactured in the South and South-West Asian region have a worldwide illicit user network.*

2. Chemicals manufactured in the South and South-West Asian region have a worldwide illicit user network. While some drugs are illicitly manufactured within the region, others such as cocaine are manufactured in far flung countries which may seek supplies of chemicals from the region. The control of such chemicals within the region will, therefore, have a significant impact on the global drug situation.

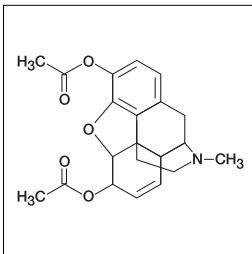
3. A drug may exist in two distinct forms, namely as base and salt. Drugs are usually extracted from natural products or are chemically manufactured in their base form. In general, bases are soluble in organic solvents such as ethyl ether and acetone, but insoluble in water. On the other hand, salts are soluble in water, and therefore suitable for intravenous injection. They are not soluble in organic solvents. The base form of a drug is often a greasy solid, wax, oil or even liquid, while salts tend to



be free flowing crystalline solids. Further, salts are generally more stable than their base forms. These properties make salts easier to handle, distribute and sell.

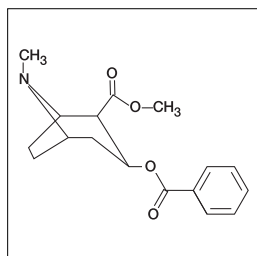
## Heroin

*Heroin is the most important illicitly manufactured drug in the region.*



4. Heroin is the most important illicitly manufactured drug in the region. It is a semi-synthetic product manufactured from raw opium, which is obtained from the opium poppy. Morphine is the principal alkaloid of opium. The conversion into heroin is carried out in a stepwise manner in clandestine laboratories:
  - i. extraction of morphine base from opium;
  - ii. conversion of morphine base to heroin base;
  - iii. conversion of heroin base to water soluble heroin hydrochloride.
  
5. The manufacture of one kilogram of heroin requires 10 kilograms of opium and 20 kilograms of other substances. Chemicals are required in every step in the manufacture of heroin, and these include alkalis (calcium oxide or hydroxide; ammonium chloride or hydroxide; calcium carbonate; sodium carbonate or bicarbonate), acids (tartaric, hydrochloric or sulphuric), an acetylating agent (almost always acetic anhydride or occasionally acetyl chloride) and solvents (acetone or ethyl ether). The general scheme of manufacturing heroin and cocaine, using classic production and

## Cocaine



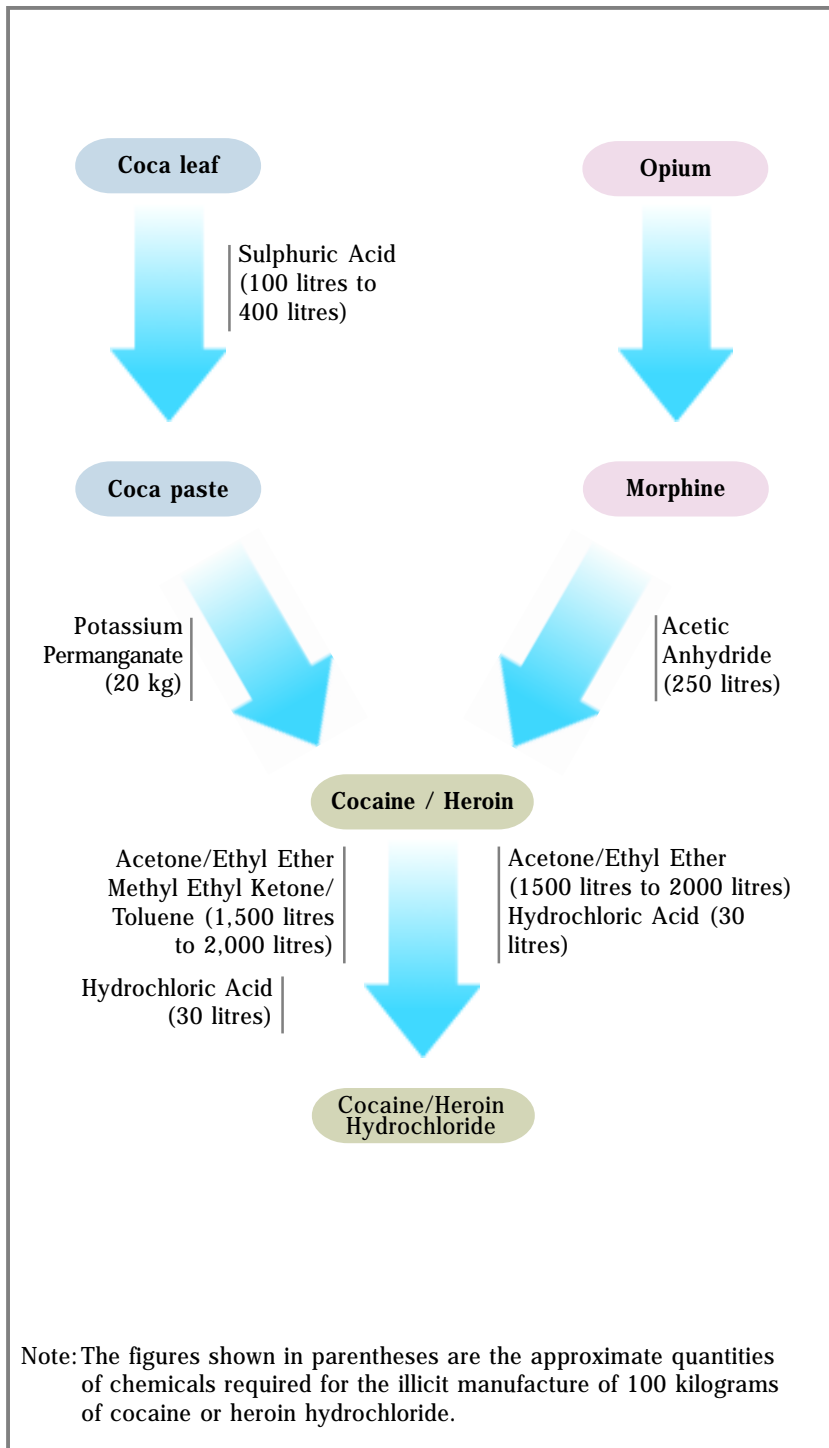
## Synthetic drugs

manufacturing methods, and the quantities of Table I and II substances required are shown in figure 5.

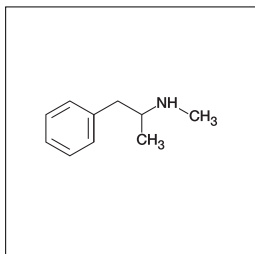
6. While many basic chemicals are used in the manufacture of heroin, the specific substance of critical importance is acetic anhydride, which is required for the conversion of morphine base to heroin base. Using the traditional method of manufacture, 2.5 litres of acetic anhydride are required for the manufacture of one kilogram of heroin.
7. Many of the basic chemicals, namely bases, acids, solvents and salts used in the illicit manufacture of heroin are also used in that of cocaine (figure 5). The chemical of critical importance, corresponding to acetic anhydride in the case of heroin, is potassium permanganate, which is essential for the manufacture of cocaine of high purity. One kilogram of cocaine requires 0.2 kilograms of potassium permanganate, 1 to 4 litres of sulphuric acid and 15 to 20 litres of solvents.
8. Unlike the natural and semi-synthetic drugs, a key requirement of synthetically manufactured drugs is the need for a suitable precursor starting substance. In other respects, namely in their extraction and purification, general reagents and solvents are required as in the manufacture of heroin and cocaine.



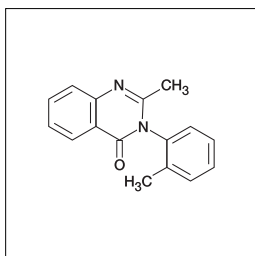
**Figure 5. Illicit  
Manufacture of  
Cocaine and Heroin**



## A Methamphetamine



## B Methaqualone

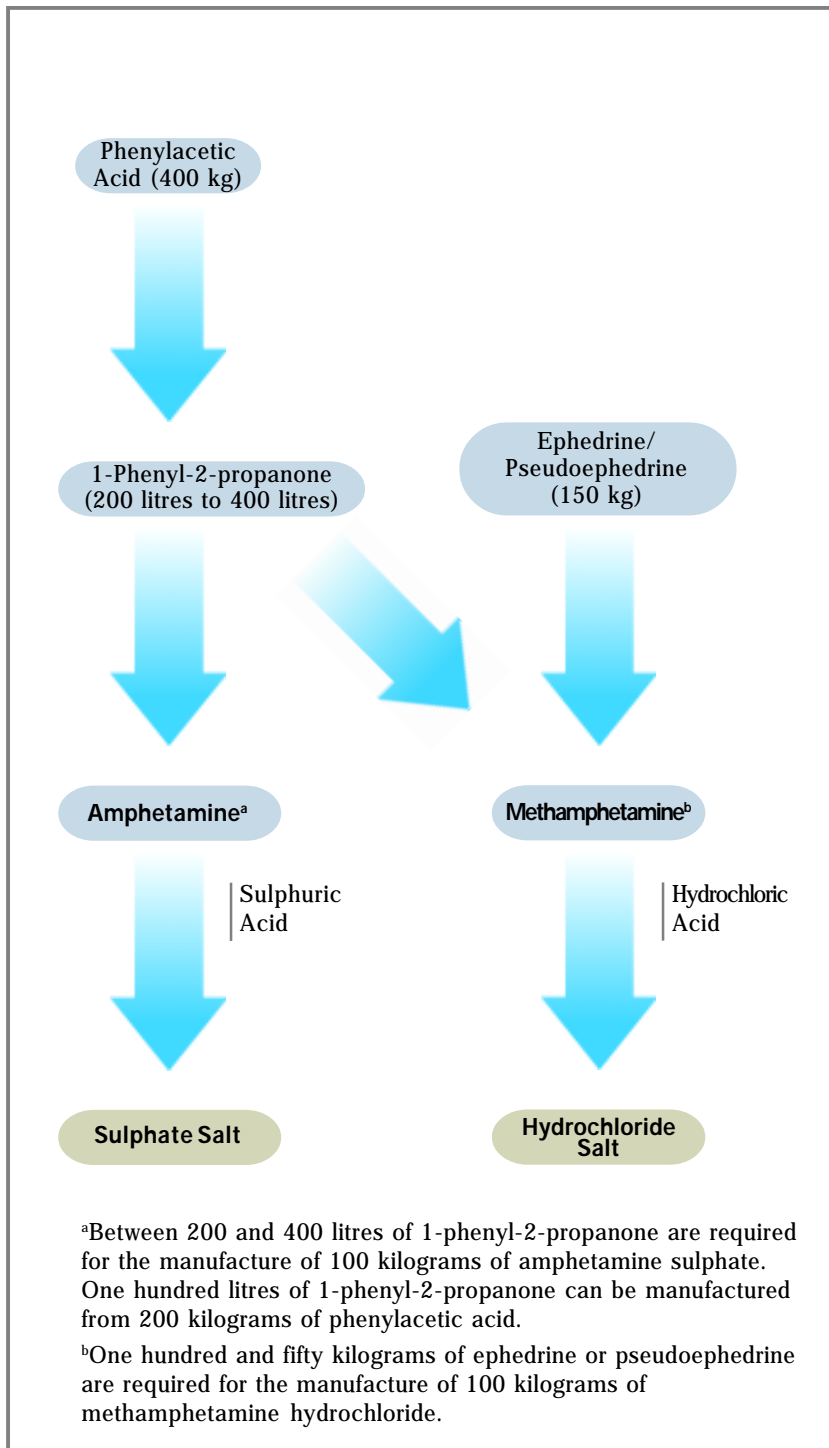


## C Other Synthetic Drugs

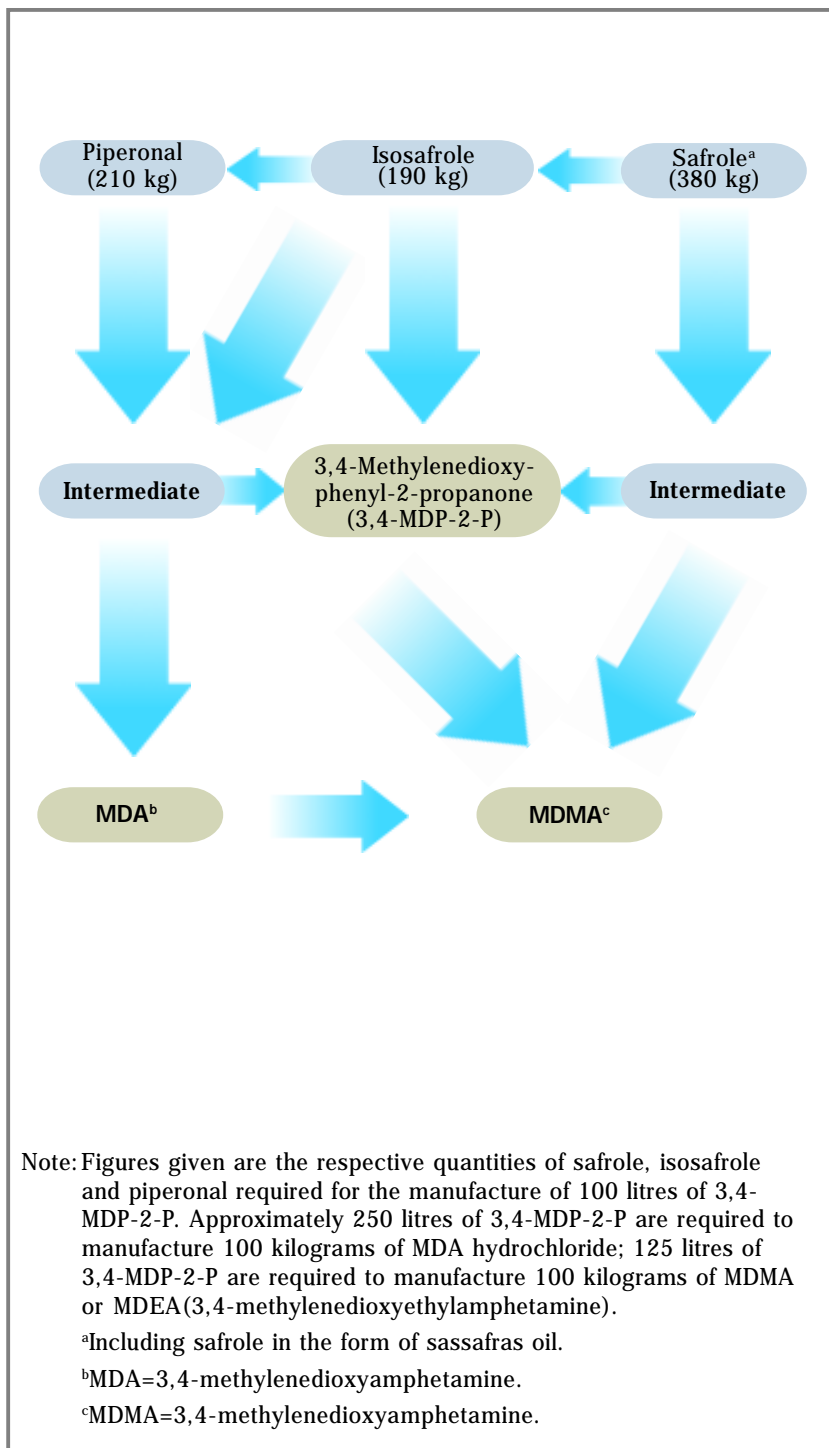
9. Methamphetamine is commonly prepared illicitly by the reduction of ephedrine or pseudoephedrine using red phosphorus and hydroiodic acid (figure 6). It is then converted to methamphetamine hydrochloride by adding hydrochloric acid. An alternative method of manufacture is by reacting 1-phenyl-2-propanone with methylamine or methylformamide. For the manufacture of 1 kg of methamphetamine, 1.5 kg of ephedrine or pseudoephedrine or 2 to 4 litres of 1-phenyl-2-propanone are required.
10. The most favoured method for the illicit manufacture of methaqualone is by reacting *N*-acetylanthranilic acid with *o*-toluidine in the presence of phosphorus oxychloride or trichloride. In many cases, the *N*-acetylanthranilic acid used as precursor has itself been prepared by traffickers by reacting anthranilic acid with acetic anhydride or by a combination of acetic anhydride with acetic acid (Figure 8). 1.25 kg. of *N*-acetylanthranilic acid or one kilogram of anthranilic acid will yield one kilogram of methaqualone.
11. Figures 6, 7 and 8 outline the typical uses of substances listed in Tables I and II of the 1988 Convention which are frequently used in the illicit manufacture of MDA/MDMA, Methaqualone, LSD, Phencyclidine, Amphetamine and Methamphetamine



**Figure 6.**  
**Illicit Manufacture of**  
**Methamphetamine**  
**and Amphetamine**



**Figure 7.  
Illicit Manufacture of  
MDMA and Related  
Drugs**







**Figure 8.  
Illicit Manufacture of  
LSD, Methaqualone  
and Phencyclidine**

