Donna Alvarado & Rick 1/28/86
Ventura/ACTION 675 11:30am

PRESERVATION COPY

ACTION
WASHINGTON, D.C. 20525

OFFICE OF
THE DIRECTOR

13 NOV 1986
3848

November 7, 1986

Thomas J. Gleaton, Jr. Ed. D.
National Parents' Resource Institute
for Drug Education, Inc.
100 Edgewood Ave., Suite 1216
Atlanta, Georgia 30303

Dear Dr. Gleaton:

Thank you for acknowledging ACTION's sustained commitment to PRIDE and to the thousands of concerned parents assisted each year in part as a result of ACTION commitment totaling $1,220,914 since 1982.

I appreciate your acknowledgement. I am, however, concerned by the incorrect and misleading information your letter conveys concerning the termination of ACTION funding to PRIDE. As you are aware, on Thursday, October 23, 1986 you spoke by telephone with ACTION Deputy Director Rick Ventura and were informed at that time that ACTION funding for PRIDE would be extended through the second quarter of FY '87 (March 31, 1987). On Monday, October 27, 1986, Rick Ventura and I met with Dr. Carlton Turner and Mr. T. Ross, the IBM loaned executive to your organization, a meeting scheduled with your knowledge, to discuss ACTION funding for PRIDE. At that meeting ACTION agreed to continue funding for the PRIDE 800 toll-free telephone number through the third quarter of FY '87 (June 30, 1987).

Given the fact that you spoke with Mr. Ventura on October 23, 1986 and were advised at that time of the agency's intentions and were presumably apprised of the results of the meeting of October 27th, I am understandably dismayed by your letter of October 27, 1986.

In keeping with President Reagan's private sector initiative and in concert with ACTION's policy for Part C Demonstration grantees, PRIDE was informed as far back as the fall of 1985, that all ACTION Part C Demonstration grants are to assume financial self-sufficiency through private support. As you are aware, the intent of volunteer demonstration projects as authorized by Congress under Part C, Title I is to provide a small amount of money to a grantee for a very limited time, one to possibly two years, to develop a model volunteer program that may be replicated nationwide.

ACTION continues to encourage your efforts and applaud your achievements with parents and children in our mutual fight against drug abuse. In that light, we have funded PRIDE for four and one-half years, since March, 1982, and provided technical assistance in order to advance your efforts to develop a funding base exclusive of federal dollars. We anticipate that those efforts will be successful, as confirmed by Mr. Ross, by June, 1987.

Sincerely,

Donna M. Alvarado

Donna M. Alvarado

cc: Nancy Reagan
Dr. Carlton Turner
Senator Orrin Hatch
Senator Paula Hawkins
Senator Mack Mattingly
Otto Moulton
T. Ross

Mike Corbey

June 7, 1985 - Breakfast with Donna Alvarado and Maiselle Shortley

July 9, 1985 - Breakfast with Alvarado, Gleaton, Barun & Wrobleski

September 3, 1985 - Meeting with Hammock, Shortley & Ventura

1-28-86 Buddy 1.3 Million Dollars to 124

* - Demonstration Grant $1.0m 2 to 345 Pride 1/3 of Demograph
$/50K or less

* - Earliest 30 Sept Latest 31 Dec Cut off of PRIDE

Rae → * Dick Bi Gowen Action Direct
→ * Walt Davis Atlanta Action

SOS DROGUE INTERNATIONAL

Fil
Amie

INTERNATIONAL AND PLURIDISCIPLINARY SYMPOSIUM ON DRUG ADDICTION : "THE POLITICAL AND SOCIAL ISSUES AT STAKE"

under the auspices of the
International Mission
for the Struggle against Drug Addiction

U.N.E.S.C.O.

Wednesday 26th, Thursday 27th and Friday 28th February 1986
7, Place de Fontenoy 75007 PARIS

SOS DROGUE INTERNATIONAL

FOUNDING MEMBERS - STEERING COMMITTEE

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Criminologist, research worker at the Institut de Droit Comparé
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Professor Marc BOURGEOIS : Psychiatrist, the University Hospital Center of Bordeaux
Dr. Michel Patrick DENISTY : Acupuncturist
Dr. François-Rodolphe INGOLD : Epidemiologist, Chairman of the group of experts
in epidemiologie in the Pompidou group
Professor Jacques LEAUTE : Director of the Institut de Criminologie de Paris
(Paris Institute of Criminology)
Professor Serge LEBOVICI : Professor of the Faculty of Medicine of Bobigny
Professor François RAVEAU : Anthropologist, Lecturer at the Ecole des Hautes Etudes
en Sciences Sociales (School of higher studies in the Social Sciences), C.R.E.D.A.
Dr. Christian RECCHIA : Nutritionist
Professor Jacques RUFFIE : Anthropologist, Lecturer at the Collège de France

CANADA :

Professor Denis SZABO : Criminologist, Director of the University Comparative Law
and Criminology of Montreal

F.R.G. :

Professor Josef M. HAUSSLING : Criminologist, Rector of the University of Wuppertal
Associate Lecturer at the University of Paris II

U.S.A. :

Professor Patrick HUGHES : Epidémiologist, University de Chicago

ISRAEL :

Professor Maurice PRYWES : Founder of the Faculty of Medicine,
Lecturer in medicine at the University of Ben Gourion, Bersheva

SOS DROGUE INTERNATIONAL

DRUG ADDICTION :
"The Political and Social Issues at Stake"

Should drug addiction be considered as an offence or as a deviance ?
Should those taking narcotics be viewed as marginals, delinquents or as sick persons ?
To give a precise answer to these questions is to begin to find a solution.
Although society must of needs find a solution, its responses take different forms and, in the light of the experience of different countries in this field, we must have a heterogeneous view of the problem. Indeed, national policies concerning the "drug issue" are varied, different and often divergent, if not contradictory.

Today, S.O.S. DROGUE INTERNATIONAL proposes to organize, for the first time, a scientific meeting at the international level on the sociological, legal and medical problems posed by drug addiction.
Such a symposium is certainly original in that it aims at dealing with the problem of narcotics from a disciplinary standpoint in order to effectively take into account the heterogenous nature of this social problem and in order to give birth to a new policy geared for planning ahead instead of merely seeking to adjust.
The use of narcotics is primarily an act (offence and/or deviance) which, paradoxically, calls for a cumulative if not an alternative response. Although it is incumbent upon the State to intervene, the medical and social sectors are also concerned. The golden means remains to be found in view of combining efforts at two levels, the governmental and the societal.

S.O.S. DROGUE INTERNATIONAL hopes that this symposium, which benefits from so much diversity and promotes the confrontation of ideas, will make it possible to contribute to the drafting of tomorrow's "drug policy".
Through the exchange of ideas among scientists and wide dissemination of the debates, S.O.S. DROGUE INTERNATIONAL seeks to promote public awareness at an international level and to define the issues at stake.

DRUG ADDICTION : "The Political and Social Issues at Stake"

Philippe BARDIAUX
Chief Administrator
of the Scientific Council

DRUG ADDICTION
"The Political and Social Issues at Stake"

Draft Program for the International and Pluridisciplinary Symposium to be held on Wednesday 26th, Thursday 27th and Friday 28th of February 1986.

Wednesday, February 26th, 1986
SOCIOLOGY - CRIMINOLOGY

Morning : Opening ceremony
- Mr. Laurent FABIUS, Prime Minister
- Mrs. Régine CHOUKROUN, Chairman of S.O.S. DRUG INTERNATIONAL
- Dr. Claude OLIEVENSTEIN, Chief Doctor at the MARMOTTAN Medical Center

1st topic : Sociology
- Mr. Jean-Paul ARON, Sociologist

Debate

Opening Cocktail Party

Lunch at U.N.E.S.C.O.

Afternoon : 2nd topic : Criminology - Anthropology
Chariman : Professor Jacques RUFFIE, Anthropologist
Lecturer at the Collège de France
- Professor Denis SZABO, Criminologist, Director of the University of Comparative Law and Criminology of Montreal
- Professor François RAVEAU, Anthropologist, Lecturer at the Ecole des Hautes Etudes en Sciences Sociales (C.R.E.D.A.)
- Dr. François-Rodolphe INGOLD, Epidemiologist, Chairman of the Group of experts in epidemiology in the Pompidou group

Debate

Closing Speech :
Mr. Gilbert BONNEMAISON,
Vice-Chairman of the National Council for the Prevention of Delinquency
Deputy Mayor of Seine Saint Denis

Cocktail party

Thursday, February 27th, 1986
POLICIES CONCERNING CRIME - COMPARATIVE LAW

Morning : 3rd topic : Policies Concerning Crime
Chairman : Professor Marc ANCEL,
Chairman of the Honorary Chamber of the Court of Cassation
Honorary Chairman of the Center of Comparative Law of the University of ParisII
- Mr. R.J. MANSHOT, Queen's Attorney in Amsterdam
- LHC HULSMAN, Lecturer at the Faculty of Law of the Erasmus University of Rotterdam, Advisor to the Minister of Justice of the Netherlands
- Mr. Jacques FRANQUET, Commissioner, Chief of the central office for the repression of illegal drug traffic.

Debate

Lunch at U.N.E.S.C.O.

Afternoon : 4th topic : Comparative Law
Chairman : Professor Josef M. HAUSSLING, Criminologist,
Rector at the Universite of Wuppertal,
Associate lecturer at the University of Paris II
- Professor Bernardo BEIDERMAN, Director of the Institute of Criminology and Comparative Law of the University of BUENOS-AIRES
- Professor McCLINTOCK F.H., Director of the Edimburg Center of Criminology, Sociology and Legal Philosophy
- Professor Antonio BERISTAIN, Director of the Institute of Criminology of San Sebastien
- Professor Obrad O'PERIC, Lecturer at the Law University of Belgrade

Debate

Closing Speech :
Mrs. Simone ROZES, First Chairman of the Court de Cassation

Cocktail party at the
Hôtel de Ville de Paris
in the presence of Jacques CHIRAC, Mayor of Paris

Friday, February 28th, 1986
RESEARCH AND THERAPEUTICS

Honorary Chairman : Professor Daniel BOVET
Nobel Prize in Physiology and Medicine (1957)

Morning : 5th topic : Research
Chairman : Professor R.C. SCHUSTER,
Lecturer in Psychiatry at the University of Chicago
- Professor REDMOND, Lecturer in Psychiatry at the Yale University School of Medicine
- Professor KIYOSHI ANDO, Director of the Department of psycho-pharmacology, Preclinical Research Laboratories, Kawasaki, Japan
- Professor Yves PELICIER, Lecturer in Psychiatry at the Faculty of Medicine of Paris
- Professor Pierre SIMON, Pitié-Salpétrière Faculty of Medicine Departement of Pharmacology

Debate

Lunch at U.N.E.S.C.O.

Afternoon : 6th topic : Therapeutics
Chairman : Professor Serge LEBOVICI,
Lecturer at the Faculty of Medicine of Bobigny
- Professor Maurice PRYWES, Founder of the Faculty of Medicine Lecturer in Medicine at the University of Ben Gourion, Bersheva
- Professor Marc BOURGEOIS, Psychiatrist at the University Hospital Center of Bordeaux
- Dr. Alain BRACONNIER, Chief of Service at the Psychiatric and Psychotherapeutic Center, Philippe Paumelle
- Professor Medhi PAES, Lecturer in Psychiatry AR RAZI Salé Hospital, Morocco

Debate

Closing Ceremony :
Edgar FAURE, chairman

Closing banquet

SOS DROGUE INTERNATIONAL

The association's objective is to study all problems posed by drug addiction in France and abroad.
The association's objectives concern the setting up of new research in the field of prevention and socio-professional rehabilitation.
Furthermore, considering its international vocation, the association aims at promoting scientific research in the medical, legal, sociological and psychological fields, as well as at more concrete involvement in areas such as social work and the educational sector.

The association has set up an information center in Paris, whose objectives are varied :
- establish a S.O.S. telephone service,
- cater to families,
- provide guidance for young people in difficulty,
- inform and train social workers.

S.O.S. DROGUE INTERNATIONAL proposes to manage mechanisms geared for providing assistance with regard to professional rehabilitation in view of offering job opportunities and training to young people faced with serious problems and wishing to be reintegrated into society.
In addition, the association proposes to intervene in view of lending assistance to families faced with problems concerning imprisonment of their relatives abroad.

To date, the association has carried out several operations bearing on a topic which is even **more serious** than drugs, namely indifference :
- CONCERT AT THE CITADEL OF VILLEFRANCHE SUR MER : August 7th, 1984, under the honorary chairmanship of Mr. Franck PERRIEZ, chairman of the Interministerial Mission for the Struggle against Drug Addiction, attended by Mr. and Mrs. Raymond BARRE, Mrs. Lydia VARSANO and Mr. Joseph CALDERONI, mayor of Villefranche Sur Mer.

- RECEPTION AT THE THEATRE DU GYMNASE, with the participation of Thierry LE LURON, November 26th 1984, under the honorary chairmanship of Mr. and Mrs. Jacques CHABAN-DELMAS.
30% of the proceeds from this reception were handed over to the "Toxicomanie et Prévention Jeunesse" Foundation (Drug addiction and prevention among young people), of which Mrs. Jacques CHABAN-DELMAS is the chairwoman.

- RECEPTION AT THE REX, with the participation of Julio IGLESIAS : January 14th 1985, under the honorary chairmanship of Mr. Laurent FABIUS, Prime Minister.

- THE BAL DES CASAQUES, at the Casino of Trouville : August 10th 1985, under the chairmanship of Mrs. Serge FRADKOFF. The BAL DES CASAQUES will be organized each year and will bear the colors of the owner who will preside over the event.

Mairie Expo 85 : from the 25th to the 30th of November 1985.
S.O.S. DROGUE INTERNATIONAL was present at this town council exhibition, in order to promote awareness among those in charge of town councils, concerning the problems posed by drugs and, in particular, to present them with certain forms of preventive actions.

- THEATER : 15 TO 29 NOVEMBER 1985
The Association S.O.S. DROGUE INTERNATIONAL and the "Toxicomanie et prévention Jeunesse" Foundation (Drug addiction and prevention among young people), of which Mrs. Jacques CHABAN-DELMAS is the chairwoman, lend financial support to the Paul Eluard Theater, situated in Choisy le Roi, within the framework of a play entitled S.O.S. which was created by the JE-TU-IL Company and is produced by Bernard BETREMIEUX.

The association is now organizing :
- The INTERNATIONAL AND PLURIDISCIPLINARY SYMPOSIUM : the 26th, 27th and 28th of February 1986, bringing together the most important people in the legal and medical fields, on the topic :

"Drug Addiction, the Political and Social Issues at Stake"

This would not have been possible without the participation of the State, territorial collectivities and the generosity of donors and sponsors, enabling the future establishment and smooth running of the parents' information center, as well as a rehabilitation mechanism.

SOS DROGUE INTERNATIONAL

GENERAL INFORMATION

Date and venue of the symposium
The symposium will be held on the 26th, 27th and 28th of February 1986 at U.N.E.S.C.O. 7, Place de Fontenoy, 75007 PARIS.

Participation costs
Participation costs are set at 2300 FF per person and comprise :
- participation in all meetinge
- complete documentation concerning the symposium
- simultaneous translation,
- meals during the symposium

Official Language
French and English, Simultaneous Translation is ensured.

Hotels
3 categories of hotels have been selected, prices are indicated per room and per night and comprise : breakfast, service and charges.
Concerning specific categories of hotels, as a rule, satisfaction can only be guaranteed to those participants whose request has reached us before ~~December 31st 1985~~ January 15th 1986 at the latest. Beyond this date, requests will depend upon rooms vacant.

Categories of hotels

- Category I :	set price for 1 or 2 persons :	Méridien 680 FF
- Category II :	set price for 1 or 2 persons :	Waldorf 363 FF
- Category III :	set price for 1 or 2 persons :	L'Arcade 246 FF

Payment
Payment for participation costs, as well as hotel expenses, must be sent in at the same time as registration forms. Registration will not be considered before participation costs are paid.
Payment shall be made by check or postal check.
Checks shall be made out to : S.O.S. DRUG INTERNATIONAL

Registration
The number of participants being limited, a selection shall be made, taking into consideration the date on which the registration form was sent.
The secretariat wishes to draw your attention to the fact that it is in your best interest to send us your reservation as soon as possible.
Additional information will be sent to you by the secretariat.

The final program
You will receive the detailed schedule of the symposium, the title of speeches and any new information on practical matters in the final program towards the beginning of January 1986.

SOS DROGUE INTERNATIONAL

REGISTRATION FORM

International and Pluridisciplinary Symposium
"Drug Addiction : the Political and Social Issues at Stake"
U.N.E.S.C.O.
The 26th, 27th and 28th of February 1986

Registration forms must be sent as soon as possible to : Agence Contacts 58, avenue Kléber 75016 PARIS

Name : Mr./Mrs. .....

Fore name .....

Post Occupied : .....

Address : .....

..... Zip Code .....

Country : .....

Telephone : .....

will participate in the international symposium on : "Drug Addiction : the Political and Social Issues at Stake"

On behalf of : .....

on a personal basis.

Wishes to receive the symposium's documents in :

English

French

HOTEL RESERVATION

Wishes to reserve the following room(s) :

Category	Room	Date of Arrival	Date of departure
I	☐ 680 FF	.....	.....
II	☐ 363 FF	.....	.....
III	☐ 246 FF	.....	.....

PAYMENT

Participation costs (2300 FF per person). ..... FF

Hotel expenses : ..... night(s) at ..... Francs. ..... FF

..... FF

Payment for participation costs as well as hotel expenses must be sent in at the same time as registration forms. Registration will ot be considered before participation costs are paid.

Your participation and reservation will be confirmed as soon as possible.

Payment shall be made by check, postal check or bank transfers to the account of S.O.S. DROGUE INTERNATIONAL N°

Date .....

Signature .....

SOS DROGUE INTERNATIONAL

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Secretariat of the Symposium
Contacts Agency
58 avenue Kléber
75016 PARIS
Tel. 45.05.14.70

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USA:	
Prof. Patrick Hugues	Criminologist
ISRAEL	
Prof. Maurice Prywes	Founder of the School of Medicine Prof. of Medical Education, Ben Gurion University in Bersheva

S.O.S. DRUG INTERNATIONAL

The extensive damage caused to young people and their families from drug addiction, as well as to society, is such that it justifies resolute and continuous efforts to stop it.

Increasingly younger segments of the population are being affected by this phenomenon. In all environments, new forms of drug addiction are appearing:

--Inhalation of solvents and glues
--Use of medication for other than therapuetic purposes
--Alcoholism

It is a cry of alarm from troubled youths, in the form of a shift to acts of desperation. Our attention and reflection should be centered on the impact of drugs, on the profound state of ill-being of youths.

In our country, apart from the general health system, there is a specific one for the cure and post-cure of addicts, to which competent professionals are dedicated.

The care of drug addicts is not miracle work, but general work with people who are suffering.

The ideological conflicts over the therapeutic methods should be lessened in solidarity with those needing attention. Care given to a drug addict should be given in relation to his needs, rather than being based on the desires of the therapist.

Of course, any method that goes contrary to the dignity or freedom of the individual must be prohibited altogether.

The association S.O.S. Drug International proposes to put skills and new means at the service of drug addicts, their families and the professionals involved.

In 1984, the Association spent its first year of activities in close collaboration with the Interministerial Mission Against Drug Addiction.

The results of this work are encouraging enough to foster continued efforts in this area, which implies constantly renewed resources, in order to permit not only its development but also new actions.

A conversation with Mr. Laurent Fabius, Prime Minister, has enabled us to assess the extent of his personal interest in the Association's activities, and he has given us assurances of his support.

Mr. Jacques Chirac, Mayor of Paris, is going to put at the disposal of the Association a center where we will be able to establish an office, in order to be able to provide counseling and assistance there to families affected by this problem.

The Association has completed several projects:

--CONCERT AT THE CITADEL VILLEFRANCHE SUR MER: August 7, 1985, under the Honorary Chairmanship of Mr. Franck Perriez, President of the Interministerial Mission Against Drug Addiction, with Mr. and Mrs. Raymond Barre, Mrs. Lydia Varsano, and Mr. Joseph Calderoni, Mayor of Villefrance Sur Mer.

--Evening at the Gymnase Theatre, with Thierre Le Luron. November 26, 1984, under the Honorary Chairmanship of Mr. and Mrs. Jacques Chaban-Delmas.

Thirty percent of the proceeds from this evening went to the foundation "Toxicomanie et Prevention Jeunesse" /Drug Addiction and Prevention Among Youths/, the President of which is Mrs. Jacques Chaban-Delmas.

--Evening at the Rex, with Julio Iglesias: January 14, 1985, under the Honorary Chairmanship of Prime Minister Laurent Fabius.

--Casaques Ball, at the Trouville Casino: August 10, 1985, under the Chairmanship of Mrs. Serge Fradkoff.

Every year the ball will be repeated and will have the colors of the person chairing the event.

And now:

--International and Multidiscipline Scientific Colloquium: February 26-28, 1986, with the most important persons of the legal and medical world, on the topic, "Drug Addiction, a Political and Social Threat"

This work could not take place without the assistance of its generous donors and sponsors, who make it possible to ensure the smooth running and upcoming completion of a parent information center and a rehabilitation structure.

SOS DRUG INTERNATIONAL

Drug Information Documentation Center Plan

The first link in the chain could be the creation of a drug information and documentation service.

The tasks of this institution would be numerous:

- S O S telephone:

From a widely advertised telephone number the center could make it possible to provide information at different levels.

- Parents:

The request made by the parents is always urgent and tinged with great anguish - sometimes even with some guilt feelings.

The foremost aim is to defuse the situation and to soothe anxiety in order to make it possible for a true dialogue to take place and to allow a better understanding of the situation, because no effective preventive or curative attitude can be adopted in an exacerbated emotional context.

To defuse does not mean to make it trite, but to take a certain distance with regard to a very complicated problem for the parents who are always very emotionally involved.

It is appropriate to distinguish two kinds of requests:

- those coming from parents of young occasional drug users;

- those coming from parents of drug addicts.

Same old Approach

In the first case, the conversations aim at informing the parents on the stances to take in order to prevent the aggravation of a situation which most of the time is not of a really alarming nature.

Insofar as the parents of drug addicts are concerned it would be necessary, without doubt, to put them in contact with a specialized agency which would be with them while they go through their difficulties to help them to overcome them.

- Young people in trouble:

It is not a question here of only limiting oneself to specific responses vis-a-vis drug addiction but of trying to guide young people towards services which would be best equipped to respond to their questions: jobs, training, etc. And especially concerning the problem of drug dependency leading them to specialized agencies in Paris and in the country.

--Social services:

The professionals who are in touch with youth often admit their helplessness in dealing with drug problems.

Teachers, educators, general practitioners, youth club leaders, etc.

--International relations:

The quality and diversity of the members of the Scientific Council will make possible, in addition to basic work on all of the activities of the Association, a special approach to the international aspect:

--foreign legislation
--system of treatment
--useful addresses, etc.

--Informing the public:

The information should respond to the questions being asked by the public.

Clarity, credibility and intellectual precision being the main elements of information in the field of drug addiction, such information should then make it possible to facilitate prevention, thanks to its appropriateness.

Informing parents, children, adolescents, in short, all those who are likely one day to become "drug addicts" has become a priority, a priority which has no other ambition than to fight against "drug tales and legends."

Pro-Drug ?

DRAFT REHABILITATION STRUCTURE PLAN

Beyond the problems of physical and psychological severance, one of the stages of social and professional rehabilitation is sorely lacking.

The traditional rehabilitation structures, the 16-18 or 23-25 year periods, do not correspond to the profile of former drug addicts, whose age is much higher and adaptive ability much slower.

The danger existed of creating rehabilitation ghettoes, reserved exclusively for former users of toxic products. It is a matter of putting in place structures allowing young persons in trouble, former addicts, to rediscover the realities of professional rehabilitation.

Specifically, the Mayors of Marseille and Bordeaux have given their consent for such institutions to be established in their cities.

These structures, whose administrative support could be Circular 44 of the Social Action Administration, could be of several types.

In each, the objective the objective is to receive 15 youths in a job-training situation, part of the time dedicated to learning new skills and the other to actual public service.

There would be a case of a hair-dressing salon type in one of the two towns and in the other a restaurant for application.

The youths would be trained by professional teams, made up of technical training and education professors.

This would thus be a professional springboard that would take in all the necessary conditions for resocialization:

--learning of a skill
--integration in company life
--contact with the public

The structures described above should operate in close collaboration with the professional organizations for the skills in question, so that at the end of this springboard period, orientation can be made toward a job.

Translated by CRS Language Services, November 12, 1985

DIVISION OF NARCOTIC DRUGS

RECOMMENDED METHODS FOR TESTING HEROIN

MANUAL
FOR USE BY NATIONAL
NARCOTICS LABORATORIES

UNITED NATIONS

DIVISION OF NARCOTIC DRUGS
Vienna

RECOMMENDED METHODS FOR TESTING HEROIN

MANUAL FOR USE BY NATIONAL NARCOTICS LABORATORIES

UNITED NATIONS
New York, 1986

ST/NAR/6

CONTENTS

INTRODUCTION

Background

Over the past few years there has been a considerable increase in the number of scheduled substances newly included under international control. This increase reflects a rapid diversification of drugs of abuse, and the consequent increase of regulatory efforts results in turn in a larger number of controlled substances and in better but, at the same time, more stringent national legislation and sentencing provisions. At the same time, the seized quantities of drugs already under control, such as the opiates, cocaine and coca paste, cannabis products, amphetamine and related compounds have also shown an alarming and unprecedented increase in certain regions. This new situation, involving an increase both in the frequency and volume of seizures, presents a challenge not only to national law enforcement authorities, but also to the technical and scientific staff of forensic laboratories.

Owing to the ingenuity of illicit producers and promoters, unexpected new illicit drugs or combinations of drugs appear on the illicit market, requiring rapid and adequate action as well as ingenuity on the part of forensic chemists. Similarly, the increased number of controlled substances and of related legislative provisions place additional pressure on national forensic and narcotic laboratories and their staff. Analysts have to be able to deal with more substances and preparations and to use faster, more accurate and more specific methods of identification and analysis. In addition, the international character of drug trafficking requires the speedy exchange of analytical data between laboratories and law enforcement authorities both on the national and the international levels. Development of internationally acceptable methods of testing would contribute greatly to the achievement of these objectives, and this possibility has been under consideration for some time.

At its eighth special session in February 1984, the Commission on Narcotic Drugs requested the Secretary-General "to investigate the possibility of reaching agreement at the regional and interregional levels on recommended methods of analysis of drugs seized from the traffic". The Commission was of the opinion that closer scrutiny and harmonisation of the wide variety of analytical methods in use at the national level would not only ease the task of the staff of national institutions but would also facilitate the exchange of information at regional and interregional levels.

Purpose of the manual

In response to the Commission's request, a group of fifteen experts was convened in October 1985 by the Division of Narcotic Drugs in Wiesbaden at the invitation of the Federal Republic of Germany. The present manual prepared by the United Nations Division of Narcotic Drugs reflects the conclusions of the group of experts and has been designed to provide practical assistance to national authorities by describing recommended methods to be used in forensic laboratories for the identification and analysis of heroin. The manual may also serve as a guide to national authorities in assessing existing methods used within

their own government and university laboratories. This manual is the first in a series of similar manuals dealing with the identification and analysis of various groups of drugs under international control and will be followed by a similar publication dealing with cocaine analysis.

The manual suggests approaches that may help the forensic analyst to select a technique appropriate to the sample currently being examined. The analyst may then choose to follow any of the methods described in this manual, as each method can be expected to produce reliable analytical information with respect to the samples to which they are applied. Each method has been used for a number of years in reputable forensic laboratories and has been published in the scientific literature. In identifying these methods, the expert group was aware that many other useful and acceptable methods produce worthwhile analysis and information for the forensic analyst, and that a number of other acceptable options are recorded in the forensic scientific literature.

Use of the manual

Few methods are perfect, least of all in forensic drug analysis where the materials under examination are very likely to show significant variation both in their physical form and chemical composition. The choice of methodology and approach to analysis remains within the control of the analyst working within his or her own country. The analyst alone has seen the suspect material and can best judge the correct approach to the problem at hand. Furthermore the choice of methods may necessarily depend on the availability of reference materials and of instrumentation.

Not all the methods listed need to be applied to all samples of suspected heroin. Requirements may vary, for example, as a result of local trends in samples encountered, facilities available, and the standard of proof acceptable in the prosecution system within which the analyst works. The more complex methods are needed only for certain forensic requirements, such as comparison of samples or the development of typology.

In order to establish the identity of any controlled drug, it is suggested that the criteria should be at least two independent analytical parameters. The selection of these parameters in any particular case would take into account the drug involved and the laboratory resources available to the analyst. For example, two uncorrelated TLC systems would count as two parameters. Uncorrelated TLC systems in this context means that either the solvent systems or the coating on the plates are completely different. When possible, three entirely different analytical techniques should be used, for example: colour test, chromatography (TLC, GLC or HPLC) and spectroscopy (IR or UV). The actual choice of parameters is left to the discretion of the chemist.

Attention is also drawn to the vital importance of the availability of textbooks on drugs of abuse and analytical techniques. Furthermore the analyst must continually keep abreast of current trends in analysis, consistently following current analytical and forensic science literature. For this purpose, attention is drawn to the Manual on Staff Skill Requirements and Basic Equipment for Narcotics Laboratories (ST/NAR/2) published by the Division of Narcotic Drugs, which includes bibliographic references as well as a selection of well-known journals in the field.

Close liaison with national law enforcement and judicial authorities as well as between national narcotic laboratories and those at the regional level can lead to greater awareness of the latest trends in drug presentation, the illicit traffic, smuggling techniques and the preparation of evidence to courts of law. These in turn will produce a more meaningful choice of analytical techniques to be applied to the latest submissions.

It is equally important that the latest information on changes in drugs available in the illicit traffic be quickly disseminated. This may often need to be done prior to publication in specialised periodicals dealing with forensic and other chemical analyses, since these publications are available to the forensic community some two to three years after the changes become known. The value of frequently published national reports on the latest information on such changes in drugs and on work being undertaken and analytical results obtained within individual laboratories cannot be overemphasized.

The Division of Narcotic Drugs would welcome observations on the contents and usefulness of the present manual. Comments and suggestions may be addressed to:

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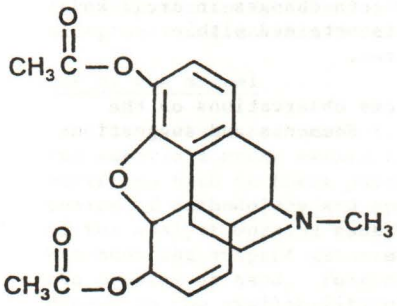
A-1400 Vienna, Austria

DESCRIPTION OF THE PURE COMPOUNDS

The reader is referred to the United Nations publication dealing with this subject - "The Multilingual Dictionary Of Narcotic Drugs And Psychotropic Substances Under Internation Control", (ST/NAR/1). Accordingly only the very commonest synonyms will be listed here.

HEROIN
Diacetylmorphine
Diamorphine

	Melting points (°C)	
	Base	Hydrochloride
	170 (173)	229-233 (243-244)

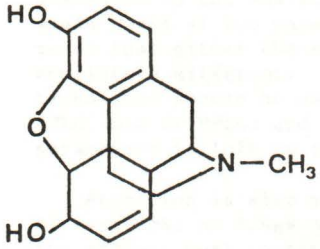


	Solubilities (1g/ml)	
	Base	Hydrochloride
Water	1700	1.6
Ethanol	31	12
Diethyl ether	100	
Chloroform	1.5	1.6

$C_{21}H_{23}NO_5$
MWt = 369.5

MORPHINE

	Melting points (°C)		
	Base	Hydrochloride	Sulphate
	254	200 (decomp.)	250 (decomp.)



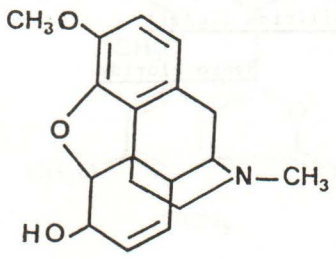
	Solubilities (1g/ml)		
	Base	Hydrochloride	Sulphate
Water	5000	soluble	soluble
Water, boiling	400		
Ethanol	250	soluble	soluble
Chloroform	1500		

$C_{17}H_{19}NO_3$
MWt = 285.3

CODEINE
Methylmorphine

Melting points (°C)

Base	Hydrochloride	Sulphate
154-158	280 (decomp.)	278



Solubilities (1g/ml)

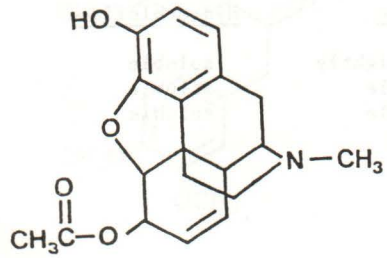
	Base	Hydrochloride	Sulphate
Water	120	soluble	soluble
Water, boiling	20	soluble	
Ethanol		soluble	slightly
Diethyl ether	50		insoluble
Chloroform	2	slightly	insoluble

$C_{18}H_{21}NO_3$
MWt = 299.4

O6-MONOACETYLMORPHINE
6-acetylmorphine

Melting points (°C)

Base	Hydrochloride
200	265-267

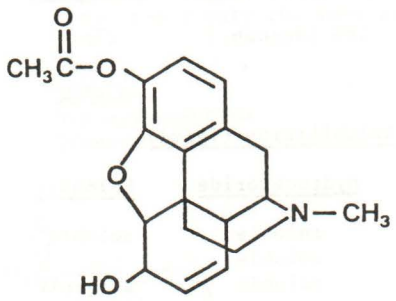


Solubilities (1g/ml)

	Base	Hydrochloride
Water	very slightly	soluble
Ethanol	soluble	soluble
Chloroform	soluble	soluble

$C_{19}H_{21}NO_4$
MWt = 327.4

O^3-MONOACETYLMORPHINE
3-acetylmorphine



$C_{19}H_{21}NO_4$
MWt = 327.4

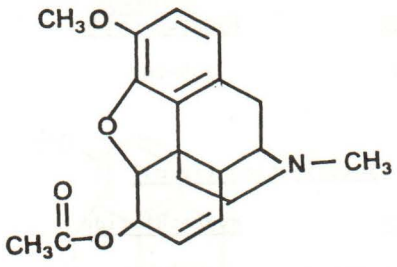
Melting points (°C)

Base	Hydrochloride

Solubilities (1g/ml)

Base	Hydrochloride

ACETYLCODEINE



$C_{20}H_{23}NO_4$
MWt = 341.4

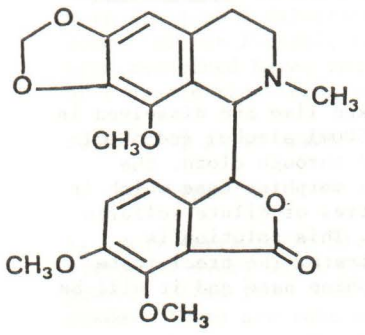
Melting points (°C)

Base	Hydrochloride
142 (sublimes)	

Solubilities (1g/ml)

	Base	Hydrochloride
Water	very slightly	soluble
Ethanol	soluble	soluble
Chloroform	soluble	soluble

NOSCAPINE
Narcotine

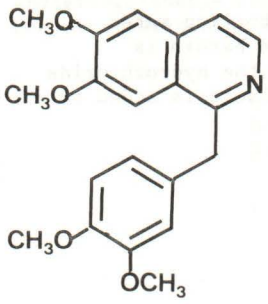


$C_{22}H_{23}NO_7$
MWt = 413.4

	Melting points (°C)	
	Base	Hydrochloride
	176 (sublimes)	220 (decomp.)

	Solubilities (1g/ml)	
	Base	Hydrochloride
Water	insoluble	4
Ethanol	slightly soluble	8
Diethyl ether	slightly soluble	insoluble
Chloroform	soluble	soluble

PAPAVERINE



$C_{20}H_{21}NO_4$
MWt = 339.4

	Melting points (°C)	
	Base	Hydrochloride
	146-148 (sublimes)	220-225

	Solubilities (1g/ml)	
	Base	Hydrochloride
Water	insoluble	40
Ethanol	slightly soluble	120
Chloroform	slightly soluble	10
Benzene,	soluble	insoluble

PRODUCTION OF ILLICIT HEROIN

The details outlined here represent just one approach to the production of illicit heroin. By the very nature of its production, variation of technique, reagents and quantities is to be expected. However, it seems not unreasonable that the general approach will be similar to that given here. This description is taken from Bulletin on Narcotics, Vol XXXVII (no. 1), 1985, pp 49-62.

1. MORPHINE FROM OPIUM

One kilogram opium is mixed with 200g of slaked lime and dissolved in two litres of water. 250g of ammonium chloride, 500ml alcohol and 500ml ether are added, and the entire solution filtered through cloth. The filtered material remaining on the cloth is crude morphine base which is purified and decolourised by refluxing with 2 litres of dilute sulfuric acid and 250g of charcoal for about half an hour. This solution is filtered and ammonium hydroxide added to the filtrate. The precipitate formed is filtered and dried in air. This is morphine base and it will be an off-white material.

2. HEROIN FROM OPIUM

One kilogram of opium is treated with lime and 2 litres of water, the resulting solution being passed through a coarse filter; 250g of ammonium chloride is added to the filtrate. Morphine base slowly precipiates and is collected on a fine cloth filter. The filtrate may be washed with water. The resulting crude morphine is redissolved in either hydrochloric or sulphuric acid with charcoal. After filtration the addition of ammonium hydroxide precipitates morphine which is filtered and air dried.

A suitable amount of dry morphine is added to acetic anhydride and the mixture refluxed at constant temperature for five hours. After cooling, the mixture is neutralised with sodium carbonate. Crude heroin base should precipitate at this stage; it is filtered and washed with water.

The crude heroin is purified by redissolving in boiling water containing citric acid and charcoal. After filtration heroin is precipitated by the addition of sodium carbonate. If the hydrochloride salt is required a suitable quantity of hydrochloric acid is added to a solution of the base in acetone.

PHYSICAL APPEARANCE AND CHEMICAL CHARACTERISTICS OF ILLICIT HEROIN

It must be stressed that no two heroin samples have exactly similar physical appearances. Produced from a highly variable natural product, by a batch process capable of wide variation, and subsequently subjected to adulteration and transformation for trafficking purposes, it is not suprising that heroin occurs in such a multitude of forms. Those listed here are just a selection, albeit the most common. Because material submitted for forensic examination bears no physical relationship to any type described here, that does not mean, of course, that it is not heroin or a heroin containing product.

SOUTH WEST ASIAN HEROIN

Two types:

1. Very variable in colour and consistency and has been encountered in virtually every shade from beige to dark brown. It is virtually always a powder, often fine, but occasionally small aggregates are present in the powder. These are soft and yield to slight pressure. This category constitutes by far the major type from this region. The physical variation is paralleled by a wide range of chemical composition but samples seized more recently indicate that a more consistent product is being made. Typically it is a fine light-brown powder with a characteristic opium-derived odour, the heroin purity is typically 60%, and all the alkaloids and derivatives are present as the base. Typical contents of the other alkaloids and derivatives are:

Acetylcodeine	5%
O^6-monoacetylmorphine	3%
Noscapine	10%
Papaverine	4%

2. A white, off-white or creamy coloured fine dry powder, has less odour than type 1., the purity is in the range 80-90%, and the heroin is present as the hydrochloride salt. Some samples of this type are indistinguishable from "pharmaceutical grade" heroin. Typical contents of the other alkaloids and derivatives are:

Acetylcodeine	3%
O^6-monoacetylmorphine	2%
Noscapine	NOT DETECTED
Papaverine	NOT DETECTED

MIDDLE EAST HEROIN

Two types:

1. Beige coloured or very light brown coloured fine powders; rarely are aggregates present. Samples containing more than 70% heroin are rare and the average purity is about 50%. The alkaloids and derivatives are present as hydrochloride salts. The contents of the other alkaloids and derivatives are:

Acetylcodeine.....3%
O^6-monoactylmorphine....2%
Noscapine.....NOT DETECTED
Papaverine.....NOT DETECTED

This type very frequently contains an adulterant, often a pharmaceutical such as procaine.

2. White or off-white coloured fine powders. Some samples contain 70-80% heroin, while other types would appear to be a diluted form of the high purity product, containing an equivalent amount of caffeine, such that the typical heroin level is reduced to 30-40%. The alkaloids and derivatives are present as hydrochloride salts. These diluted forms contain only trace amounts of acetylcodeine, 6-monacetylmorphine, papaverine and noscapine, but the highly pure forms typically contain:

Acetylcodeine.....2-3%
O^6-monoacetylmorphine.....2%

SOUTH EAST ASIAN HEROIN

Two types:

1. "Smoking Heroin" "Chinese No. 3"

A hard granular material. The granules are usually 1 to 5mm in diameter, and unlike the aggregates in South West Asian heroin they are hard and unyielding to pressure. Only a small amount of powder will be present in the material. The most frequent colour of the material is grey, although dirty brown frequently occurs and there is a special variation when the granules are red or pink coloured - "Penang Pink". A typical assay will be:

Grey or dirty brown material - Heroin 20%, Caffeine 40%, trace amounts of the other alkaloids in freshly made material, although in this type of heroin as much as 5% O^6-monoacetylmorphine may be quickly formed by hydrolysis. The alkaloids may be present as hydrochloride salts or bases; some samples would appear to consist of both salt form and base form, that is to say that hydrochloric acid has not been added in a stoichiometric amount.

Red or pink material - assay similar to grey or dirty brown material but barbitone replaces caffeine.

2. "Injecting Heroin" "Chinese No. 4"

A fine white powder with little odour and no aggregates. Virtually the entire material will consist of heroin. Noscapine and papaverine not detectable; O^6-monoacetylmorphine usually below 3%. The acetylcodeine content is usually appreciably higher than in the equivalent high purity product from South West Asia. All alkaloids present as hydrochloride salts.

For all the types of heroin of whatever origin, it must be noted that O^6-monoacetylmorphine levels occasionally are higher than those quoted. Poorly manufactured heroin samples frequently hydrolyse with heroin converting to O^6-monoacetylmorphine. Non stoichiometric addition of (usually excessive) hydrochloric acid is the most frequent cause of such hydroysis.

It is rare for the hydrolysis to result in high morphine contents - at least in illicit heroin in solid form. High morphine contents in recently seized material are most likely an indication of poor manufacturing procedure.

THE ANALYSIS OF ILLICIT HEROIN

SAMPLING

The principle reason for a sampling procedure is to produce a correct and meaningful chemical analysis. Because most methods - qualitative and quantitative - used within forensic science laboratories for the examination of drugs require very small aliquots of material, it is vital that these small aliquots are entirely representative of the bulk from which they have been drawn. Sampling should be undertaken to conform to the principles of analytical chemistry, as laid down, for example, in national pharmacopoeas or in publications such as "Official Methods of Analysis" published by the Association of Official Analytical Chemists.

There may be situations where, for legal reasons, the normal rules of sampling and homogenisation cannot be followed. For example, if the analyst wishes to preserve some part of an exhibit as visual evidence. Alternately it may be necessary to perform separate assays on two powder items, rather than combining the powders prior to a single assay being performed on the mixture, because each has been separately exhibited by the seizing officer, and the legal system within which the analyst works requires an individual result on every exhibit which is to be taken before the courts.

To preserve valuable resources and time, forensic analysts should seek, on all possible occasions, to use an approved sampling system and thereby reduce the number of quantitative determinations needed. To facilitate such an approach, the forensic analyst may need to discuss individual situations with both seizing officers and the legal personnel with whom he works.

Heroin is most frequently encountered as a fine powder, although some presentations contain aggregates which may be hard or soft. The aggregates are usually not more than 0.5cm in diameter. A seizure of heroin may be of material within a single container or package, or the material may be inside a number of packages.

SAMPLING OF SINGLE PACKAGE ITEMS

The simplest sampling situation is where the submitted item consists of a single package of material - for heroin most often the material will be a powder. The material should be removed from its container or wrappings, placed in a clean clear plastic bag and the net weight recorded. The material should then be thoroughly homogenised prior to the application of the sequence of chemical tests, although presumptive testing may be applied at this stage if it is thought that the sampling or homogenisation process will be lengthy and there is still some doubt as to the identity of the material. The simplest way of homogenising a powder is to shake it thoroughly within the clear plastic bag to which it has been transferred. If the powder contains aggregates these may be broken down by passing through successively finer sieves, or by pounding with a mortar and pestle, or by use of an adapted commercial food-mixer or food-processor.

Alternately the technique of coning and quatering can be applied as follows. The sample is mixed by shaking or stirring. Large fragments are reduced if necessary; the material is then poured on a flat surface to form a cone. The "cone" is flattened and the material is then divided at right angles, forming quarters. Opposite quarters are taken for a sample; the remainder of the material is returned to the receptacle from which it was removed. Should further coning-and-quartering be desired to reduce sample size, particle sizes are further reduced, the material mixed thoroughly, poured onto a flat surface, and divided as before.

SAMPLING OF ITEMS CONSISTING OF MORE THAN ONE PACKAGE

The analyst should examine the contents of all packages by eye, and possibly by simple colour test or TLC to determine:

1. If all packages contain suspect heroin or heroin-containing material, and/or

2. If one or more packages contain material different to that of the majority of packages. The simplest indicator is the physical appearance of the powder. If one or more packages obviously differ in content, these should be segregated and subjected to separate analysis.

The compositing of multiple container items is as follows:

(a) If there are less than 10 packages - all packages should be sampled.

(b) If there are 10 - 100 packages - randomly select 10 packages.

(c) If there are more than 100 packages - randomly select a number of packages equal to the square root of the total number of packages rounded to the next highest integer.

If the powders are found to be the same then the contents of a number of packages may be combined; the combined bulk material may then be homogenised in, for example, an adapted commercial food processor. Alternately the bulk may be subjected to coning and quartering.

When different types of material have been identified in the various packages then each sub-group should be composited in an identical fashion to that previously outlined.

Sampling errors for quantitative methods are reduced if large aliquots of material are subjected to sequential dilution with the dissolving solvent. If the cost of solvent presents no problem and if the taking of a large aliquot will not significantly reduce the size of the exhibit to be taken to court then this approach may be adopted. However when large amounts of material are used for the first dissolution, it may be necessary that the solvent should be added by pipette to avoid error due to insoluble materials. It will be rare to find large amounts of insolubles in bulk quantities of heroin seized within the developing countries or at importation points into the developed countries. However insoluble adulterants are a frequent occurence within "street" samples seized within all countries.

SAMPLING OF MATERIALS CONTAINING LARGE PARTICLES

If the particles can be easily reduced to powder then this should be the approach, and sampling procedure followed as outlined previously. Powdering may be acheived by mortar and pestle, commercial food-processor/mixer, or industrial grinder. If the material cannot be easily broken down then random sized particles should be drawn from at least three different parts of the item. A minimum of 1 gram should be collected, weighed accurately and subjected to assay.

PRESUMPTIVE TESTS FOR HEROIN

COLOUR TESTS

It must be stressed that positive results to colour tests are only presumptive indications of the possible presence of heroin or other opiate alkaloids. Many other materials, often harmless and uncontrolled by national legislation or international treaties, may give similar colours with the test reagents. It is mandatory for the analysts to confirm such results by the use of an alternative technique.

REAGENTS

Marquis reagent
8 - 10 drops of 40% formaldehyde solution is added to 10 ml of concentrated sulphuric acid.

Mecke's reagent
0.25 gramme of selenious acid is dissolved in 25 ml of concentrated sulphuric acid.

Frohde's reagent
50 milligrammes of molybdic acid or sodium molybdate are dissolved in 10 ml of hot concentrated sulphuric acid. The resulting solution should be colourless.

All colour-test reagents sould be carefully scrutinized to ensure that they have not decomposed. Colour-test reagents that are themselves coloured may lead to erroneous conclusions about the nature of the substance under test.

METHOD

The reagents are slowly dripped onto the test material which has been placed on a spotting tile. The amount of test material should not exceed what can cover the tip of a micro-spatula; no more than 3 drops of test reagent should be needed.

RESULTS

Marquis test:

Heroin	purple violet colour
Morphine	purple violet colour
Codeine	purple violet colour
O^6-monoacetylmorphine	purple violet colour
Acetylcodeine	purple violet colour
Papaverine	no colour
Noscapine	bright yellow colour

Mecke test:

Heroin	deep green colour
Morphine	deep green colour
Codeine	green/blue colour
O^6-monoacetylmorphine	deep green colour
Acetylcodeine	deep green colour
Papaverine	dark blue colour
Noscapine	green/blue colour

Frohde test:

Heroin	purple becoming grey/purple colour
Morphine	purple becoming grey/purple colour
Codeine	blue/green colour
O^6-monoacetylmorphine	yellow/green colour
Acetylcodeine	purple colour becoming pale
Papaverine	light green colour
Noscapine	cherry red colour

Note

The Marquis test is included in the test-kit supplied by the United Nations. The Marquis test and other colour tests are included in test-kits which are commercially available.

TESTS FOR ANIONS ASSOCIATED WITH HEROIN

SOLUBILITY TESTS

This test is most useful when the sample size is large and a considerable quantity of the powder can be used without seriously reducing the total amount of exhibit that can be produced in court. It may be used on small seizures by reducing both the amount of test material and solvent.

Method

1. Dissolve a portion (approximately 1 gram) of the powder or material in approximately 5 ml of distilled or de-ionised water. For small seizures 0.1 gram should be used with 0.5 ml of water.

2. Dissolve a portion (approximately 1 gram) of the powder or material in approximately 5 ml of ethanol. For small seizures 0.1 gram should be used with 0.5 ml of ethanol. This will show if any ethanol insolubles such as carbohydrate adulterants are present. The carbohydrates have only a low solubility in ethanol.

TYPE OF HEROIN	WATER SOLUBLE	PARTLY WATER SOLUBLE	INSOLUBLE
SW ASIAN (1)			*
SW ASIAN (2)	*		
MIDDLE EAST			
(1)	*		
(2)	*		
SE ASIAN (1)	*	*	
SE ASIAN (2)	*		

PRECIPITATION TESTS

REAGENTS

Nitric acid, concentrated

Hydrochloric acid, concentrated

Dilute ammonia solution: contains approximately 10% w/w of NH_3, and is made by dilution of concentrated ammonia solution (375 ml to 1 litre with water).

Silver nitrate solution: a 5.0% w/v solution of silver nitate in water.

Barium chloride solution: a 10.0% w/v solution of barium chloride in water.

Chlorides

Solutions of chlorides, (in this case heroin hydrochloride) when treated with silver nitrate solution, yield a white curdy precipitate which is insoluble in nitric acid, but soluble , after being well washed with water, in dilute ammonia solution, from which it is reprecipitated by the addition of nitric acid.

Sulphates

Solutions of sulphates, when treated with barium chloride solution, yield a white precipitate which is insoluble in hydrochloric acid.

RESULTS

Water soluble illicit heroin products are invariably found to be the chloride salt; very rarely the analyst may encounter heroin tartrate. Morphine is most frequently encountered as the sulphate, but because of residual chloride ions (from the extraction process), some morphine samples will give a postive reaction to both silver nitrate and barium chloride solutions.

This test should be confirmed, if possible by IR spectroscopy and/or X-Ray diffraction methods. Complete solubility of the powder or material in ethanol is to be expected for the majority of suspected heroin samples. Insoluble colourless crystals are a likely indication that the heroin has been adulterated ("cut") by a carbohydrate e.g. lactose. The insoluble material may be filtered, dried, and subjected to chemical testing e.g. IR spectroscopy. The amount of insoluble material may give a rough guide to the extent to which the heroin has been adulterated, but it must be noted that all the carbohydrates are soluble to various degrees in ethanol.

THIN LAYER CHROMATOGRAPHY OF HEROIN

STANDARD TECHNIQUE

Coating: activated silica gel G on glass backed plates; the coating contains a fluorescing additive which fluoresces at 254 nm.

Layer thickness: 0.25 mm.

Plates should be stored in dry conditions - over blue silica gel inside a dessicator. The plates should be protected from chemical vapours. Activation of plates before use should be at 110·C for a minimum of 30 minutes.

Size of plate: 20 x 20 cm; 20 x 10 cm; 10 x 5 cm; choice depends on number of samples to be simultaneously developed

Starting point of run = "spotting line": 1 cm from bottom of plate.

Depth of developing solvent in TLC tank: not more than 0.5 cm, not less than 0.3 cm.

Distance between applications ("spotting points"): usually 1 cm, never less than 0.8 cm.

Spots must be positioned at least 1.5 cm from edge of plate to overcome "edge effect".

Length of run: optimum is 10 cm, for this figure allows easy calculation of R_f values (Method 1. below). However if R_f values are not required, a simple approach is to allow the solvent to develop to the top of the TLC plate. In such circumstances the plates are arranged so that the maximum development does not exceed 10 cm (Method 2. below).

Method 1.

For 20 x 20 cm plates a line is drawn 11 cm from the "spotting end" which gives a 10 cm development for spots applied 1 cm from the bottom.

Method 2.

Plates of 20 x 10 cm and 10 x 5 cm dimension are placed in the TLC tank with the 10cm sides vertical; by allowing the solvent to flow to the top of the plate.a 9 cm development is produced.

It is important that the analyst monitors the progress of solvent in both methods; plates must be removed from the TLC tank as soon as the solvent reaches the "development line" or the top of the TLC plate. Otherwise diffuse spots will result.

Size of spot: the solution being applied to the plate spreads outwards from the "spotting point". The spreading of the solution should be restricted as much as possible. Otherwise diffuse spots will be produced during development. The ideal size for the application area is no more than 2 mm in diameter. To achieve this it may be necessary to apply solutions in aliquots rather than by a single discharge of the spotting equipment. The aliquots may be dried by hot or cold air between discharges. If hot air is used care must be taken to ensure that no component of the mixture under investigation is thermally labile.

The TLC tank and lid: preferably both should be of clear glass; the tank should be lined with adsorbent paper to assist saturation. The lid should be tight fitting to minimise solvent loss through evaporation. The glass may be ground and/or a smear of petroleum jelly may be applied to the rim.

The developing solvent: if a mixture, it should be made as accurately as possible by careful use of measuring cylinders. If the same solvent systems are used daily, it may be convenient to obtain each component via an automatic dispenser. Mixing may be done within the TLC tank. The developing solvent, mixture or single component, should be placed within the TLC tank in sufficient time to allow saturation to be acheived. With paper-lined tanks this should take approximately 5 minutes.

It is important to note that for certain developing systems the solvent must be renewed after each developement, or at least after 2 to 3 runs.

DEVELOPING SOLVENTS

SYSTEM A	Ethyl acetate	85% by volume
	Methanol	10% by volume
	Concentrated ammonia solution	5% by volume
SYSTEM B	Chloroform	90% by volume
	Methanol	10% by volume
SYSTEM C	Diethyl ether (Water saturated)	85% by volume
	Acetone	8% by volume
	Diethylamine	7% by volume

(The diethyl ether is rendered water saturated by being shaken with an equivalent volume of distilled or deionised water in a separtory funnel).

TWO DIMENSIONAL DEVELOPMENT

For the first front: SYSTEM A above.

For the second front:
Cyclohexane.....50% by volume
Chloroform.....40% by volume
Diethylamine.....10% by volume

Preparation of solutions to be applied to the TLC plate

Illict heroin samples

At a strength of 1 mg per ml in methanol.

N.B. In those cases where it is suspected that the concentration of heroin in the sample is very low, it may be necessary to prepare a ten-times more concentrated solution for development i.e. 10 mg per ml.

Standard solutions

All made at the stregth of 1 mg per ml in methanol.

Heroin *
O^6-monacetylmorphine
Acetylcodeine
Morphine
Codeine
Noscapine
Papaverine

* N.B. The form of standard used, salt or base, is unimportant. Either form will be satisfactory; on the TLC plates the compounds move always as the free base.

VISUALISATION

The plates must be dried prior to visualisation. This can be done at room temperature or, more quickly, by use of hot air. In the later case care must be exercised that no component of interest is thermally labile. It is important for proper colour development that all traces of ammonia or other bases are removed from the plate.

Visualisation methods:

1. UV light at 254 nm
2. Acidified potassium iodoplatinate reagent
3. Dragendorff's reagent

Spray reagents

ACIDIFIED POTASSIUM IODOPLATINATE REAGENT

Dissolve 0.25 gramme of platinic chloride and 5 grammes of potassium iodide in water to 100 ml. This is potassium iodoplatinate reagent; for the acidified version 2 ml of concentrated hydrochloric acid is added.

DRAGENDORFF'S REAGENT

Mix together 2g of bismuth subnitrate, 25 ml of concentrated (glacial) acetic acid, and 100 ml of water to produce solution (1).; dissolve 40g of potassium iodide in 100 ml of water to produce solution (2).

Mix 10 ml of solution (1), 10 ml of solution (2), 20 ml of concentrated (glacial) acetic acid and 100 ml of water to produce Dragendorff's reagent

RESULTS

R_f x 100 values*:

Compound	DEVELOPING SYSTEM		
	A	B	C
Morphine	20	0-10 (s)	0-11 (s)
Codeine	28	11-30 (s)	37
O^6-Monoacetylmorphine	39	17-28 (s)	43
Thebaine	41	32-41 (s)	66
Heroin	44	22-44 (s)	58 (+6MAM)
Acetylcodeine	44	33-44 (s)	65
Caffeine	49	64	42
Papaverine	70	78	58
Noscapine	82	82	85

(s) = streak, not spot, produced on the TLC plate.

* These values are subject to vary depending on laboratory conditions (e.g. temperature, humidity, drafts) and other parameters (e.g. age and quality of materials used).

GAS LIQUID CHROMATOGRAPHY OF HEROIN

PACKED COLUMN TECHNIQUE

Operating conditions:

Detector	FID (Hydrogen 30 ml per minute, air 450 ml per minute).
Column	6 ft (or 2 m), I.D. 2 to 4 mm.
Packing	SE-30; OV-1; OV-17 i.e. methyl silicone or methylphenyl silicone.
Carrier gas	Nitrogen at 45 ml per minute.
Operating conditions	Injector temperature: 275°C. Oven temperature: 250°C. Detector temperature: 275°C.
Internal standard	benzopinacolone (2,2,2-triphenyl acetophenone), or n-tetracosane.
Derivatizing agent	N,O bis-trimethylsilylacetamide (BSA).

Conditioning of packed columns

Prior to use, all packed columns must be conditioned. Usually the conditioning temperature should be at least 30°C above the temperature at which the analysis is to be performed, unless this would require exceeding the upper operating temperature of the column specified by the manufacturer. In this case a smaller temperature differential must be used and the conditioning period substantially extended. Example: for a column to be used at 235°C, which has an upper working temperature of 300°C, an ideal conditioning temperature would be 270°C. A typical conditioning period is usually overnight, or a minimum of 15 hours. If, in the example, the upper recommended limit for the column was 280°C, then conditioning could be performed at 260°C for 30 hours. For some columns, conditioning from Friday evening till Monday morning may be required.

During conditioning, the carrier gas to be used experimentally is passed through the column at the same flow rate as in the analysis, e.g. nitrogen at 30 ml per minute measured at conditioning temperature. During conditioning, it is vital that the end of the GC column <u>not</u> be connected to the inlet line of the GC detector. This is because silica bleads from the solid part of the stationary phase during conditioning and would soon build-up within the detector. This would severely affect detector response and ultimately, in the case of an FID, prevent hydrogen combustion by blocking the orifice of the burner. In ordinary operation silica bleads from the GC column, and the blocking of an FID burner is one of the most common causes of deterioration of detector response. In such circumstances a simple approach is to raise the operating temperature of the detector by as much as 50 to 100°C (if within the capability of the gas chromatograph). This is to volatilise ("burn-off")

the deposited silica. If this is unsuccesful the only solution is removal of the buner from the FID, unit and mechanical removal of the silica deposit. Washing with water, detergent and abrasives, followed by drying with organic solvents has been found effective.

METHOD

The standard solution of heroin hydrochloride is prepared to be 0.5 - 1.0. mg/ml. The heroin standard should be dissolved in the minimum volume of methanol, 1 ml of the internal standard solution is added and the solution made up to 50 ml with chloroform. In this final solution the concentration of the internal standard should be 0.5 mg/ml.

Treat the illicit heroin similarly, using at least 20 mg sample to give an actual heroin concentration of approximately 0.5 - 1.0 ml/ml.

In the presence of O^6-monoacetylmorphine and acetylcodeine, and for their quantitation, prepare a standard solution containing approximately 1 - 2 mg/ml of each compound by dissolving them in the minimum amount of methanol and diluting to 50 ml with chloroform. Again the internal standard should have been added to have an ultimate concentration of 0.5 mg/ml. To 0.5 ml of the standard solution as prepared above add 0.5 ml of the silylating agent in a stoppered vial and heat at 100°C for 10 minutes. Treat 0.5 ml of the illicit heroin solution prepared earlier in the same manner.

Inject 2 to 5 microlitres as appropriate.

The content (%) of any component can be calculated using the general formula:

$$C_x\% = \frac{C_{r.\ std.}}{C_{sample}} \times \frac{A_x \ / \ A_{int.std.in\ sam.\ chrom\cdot}}{A_{r.std} \ / \ A_{int.std.in\ std.\ chrom\cdot}} \times 100$$

Where:

$C_x\%$ = content of component x in the sample (w/w %)

$C_{r.\ std}$ = concentration of substance x in the standard reference solution (w/w%)

A_x = peak area for substance x obtained during the sample chromatography.

$A_{r.std}$ = peak area for substance x obtained during the standard chromatography.

$A_{int.std.in\ sam.\ chrom\cdot}$ = peak area of the internal standard obtained during the sample chromatography.

$A_{int.std.in\ std.\ chrom\cdot}$ = peak area of the internal standard obtained during the standard chromatography.

C_{sample} = concentration of the sample (w/v %).

ELUTION PROFILES ON SELECTED COLUMNS*

	COLUMN				
	SE-30(2%)		OV-1(3%)	OV-1(5%)	OV-17(3%)
Compound	A	B	C	D	E
Codeine	1.00	1.00	2.5 min	2.7 min	1.00
Morphine	1.26	1.16	2.8 min	3.2 min	1.27
Heroin	--	1.89	4.0 min	--	2.21
6MAM	--	1.44	3.5 min	--	1.46
AC	--	--	3.5 min	--	1.41
Papaverine	4.34	--	6.5 min	--	--
Noscapine	11.58	--	--	19.2 min	--

*Figures are relative retentions or absolute time in minutes. These values are subject to vary depending on laboratory conditions (e.g. termperature, humidity, drafts) and other parameters (e.g. age and quality of materials used).

6MAM = O^6-monoacetylmorphine
AC = acetylcodeine
-- = no date available

Operating conditions

	Flow rate	Oven temp.	Column length
Column	ml/min	C	ft
A	30 (argon)	207	6
B	47 (argon)	215	6
C	60	255	6
D	25	240	6
E	30	235	1.5m

Carrier gas nitrogen except for column A and B.

References:

A J. Pharm Sci., Vol 53 (No. 22), 1964, pp 1549-50.
B Anal. Chem., Vol 36, 1964, p 1907.
C Anal. Chem., Vol 44, 1972, p. .
D See "Morphine" in "Analysis of Drugs", DEA (BNDD) publication.
E Reference 1. below.

Alternative packed column methods for GC analysis of heroin:
1. Journal of Chromatography, Vol 19, 1981, pp 227-234.
2. Journal of Analytical Toxicology, Vol 4, 1980, pp 318-321.
3. Bull. Narc., Vol XXXIV (No 1), 1982, pp 37-44.

CAPILLARY COLUMN TECHNIQUE

QUANTITATIVE DETERMINATION

Detector	FID.
Column	OV-1 cross linked capillary.
Film thickness	0.20 micrometer.
Length	25 m by 0.32 mm i.d.
Carrier gas	Hydrogen.
Injection technique	split mode (ratio 1/60).
Flow Rate	circa 110 cm per second measured at oven temperature of 150°C.
Make-up gas	Argon at 18 ml per minute.
Operating temparatures	Injector: 250°C. Detector: 280°C. Temperature programme: 1. Start at 150°C. 2. Increase at 9°C per minute to 280°C. 3. Then isothermal for 0.5 minute. 4. End of programme.

Preparation of samples

For the quantitation of heroin, acetylcodeine, O^6-monoacetylmorphine, morphine, codeine, papaverine, and noscapine and the detection of other constituents about 5 mg of illicit heroin are accurately weighed together with 1 mg of tetracosane as internal standard. The mixture is subjected to silylation with 150 microlitre of MSTFA* in 1.2 ml of chloroform/pyridine (5:1 v/v) for 10 minutes at 70°C. After 1 hour at room temperature 1 microlitre is injected.
*MSTFA = N-Methyl-N-trimethylsilyltrifluoroacetamide.

IMPURITY PROFILING

Detector	FID.
Column	SE-54 cross linked capillary.
Film thickness	0.15 micrometer.
Length	25 m by 0.27 mm i.d.
Carrier gas	Hydrogen.

Injection technique	split mode (ratio 1/60).
Flow Rate	circa 65 cm per second measured at oven temparature of 150°C.
Make-up gas	Argon at 18 ml per minute.
Operating temparatures	Injector: 270°C. Detector: 300°C. Temperature programme: 1. Start at 150°C. 2. Increase at 6°C per minute to 280°C. 3. Then isothermal for 1.0 minute. 4. Increase at 15°C per minute to 300°C. 5. Then isothermal for 15 minute. 6. End of programme.

Preparation of samples

An amount of sample equivalent to 15 mg of heroin is weighed into a 15 ml centriguge tube. The sample is dissolved in 5 ml of 0.5N sulphuric acid. Then 5 ml of toluene conatining 7 micrograms per ml of n-dotetracontane as internal standard is added, the tube is shaken for 5 - 10 seconds and centrifuged. From the upper phase 4 ml of the toluene is transferred to a 10 ml concentration tube and the solvent is evaporated using a rotary evaporator. The residue is dissolved in 75 microlitres of toluene or chloroform and may be used directly for analysis.

For derivatization, 25 microlitres of MSTFA are added and the solution is heated to 70° for 3 minutes. The solution is concentrated to about 30 microlitre and 1 microlitre is injected.

Alternative capillary GC method for the analysis of heroin:

Forensic Science International, Vol 21, 1983, pp 245-251.

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY OF HEROIN

ISOCRATIC TECHNIQUE

Operating conditions

Column 250 mm by 4.6 mm i.d.

Packing material Silica HPLC grade 5 or 7 micron diameter.

Mobile phase

Hexane	75% v/v
Dichloromethane	20% v/v
Methanol*	5% v/v

* The methanol contains 0.75% v/v diethylamine

Degassing of mobile phase

Dissolved atmospheric gas within the mobile phase must be removed prior to the start of the analysis. If this is not done the gas comes out of solution and forms small bubbles either in the tubing between the solvent reservoir and the pump-head(s) or within the cylinder(s) of the pump-head(s). In either case, and especially the later, pumping will cease and the chromatographic development will be ruined.

The simplest way of removing dissolved gas is to immerse the eluant mixture in an ultrasonic bath at high power for a minimum of 10 minutes. A problem that may arise with this approach is that the water of the ultrasonic bath may become warm during a long degassing period, and the heat may be transferred to the eluant. Addition of ice to the water in the ultrasonic bath will maintain the eluant at ambient temperature. Degassing by this method may be performed in-situ by arranging for the dedicated use of an ultrasonic bath which is included as part of the entire HPLC system. The solvent reservoir is placed within the ultrasonic bath. Frequent and relatively short degassing periods should be used, possibly between each chromatographic development. The composition of the eluant must be taken into account when degassing. Components which are particularly volatile and/or which constitute only a small proportion of the eluant should not be exposed to frequent degassing. It is vital to keep the eluant reservoir closed to the atmosphere if the problem of dissolved gases is to be avoided.

It has been claimed that the ultrasonic technique is not completely effective, and that the only fully efficient way of degassing eluants is by slowly passing helium or argon gas through the solution. This approach may also be done in-situ by having a gas cylinder of helium or argon connected via tubing into the solvent reservoir. Frequent degassing may be performed between chromatographic developments. It is important to maintain the solvent reservoir beneath an atmosphere of the inert gas chosen for degassing.

Flow rate 2.0 ml per minute

Detection UV at 227 nm
Fluoresence - Excitation at 260 nm
- Emission at 400 nm

Sample preparation

Illicit heroin samples: 20.0 mg per ml are dissolved in 10 ml of the eluting solvent.

Standard solutions

Typically 12 mg of heroin, 1 mg of acetylcodeine, 1 mg of O^6-monoacetylmorphine, 2 mg of noscapine and 1 mg of papaverine are weighed accurately into a 20 ml volumetric flask. The required volume of methanol and dichloromethane are added, the powders dissolved, and finally the hexane added up to 20 ml.

N.B. It is preferable to dissolve both the illicit samples and standard materials in the methanol/dichloromethane fraction of the eluting solvent (ultrasonic agitation or shaking for 5 minutes), and then add the hexane part of the mobile phase.

Injection volume 10 microlitres by syringe or loop injector.

Quantitation by peak areas, external standard method.

RESULTS

Elution profile is as follows*:

With UV detection:	Noscapine	3 minutes
	Papaverine	4 minutes
	Acetylcodeine	4.75 minutes
	Heroin	5.5 minutes
	O^6-Monoacetylmorphine	9.5 minutes
With fluorimetric detection:	Acetylthebaol	4.3 minutes

* These values are subject to vary depending on laboratory conditions (e.g. temperature, humidity, drafts) and other parameters (e.g. age and quality of materials used).

GRADIENT TECHNIQUE

Column 125 mm x 4.6 mm ID

Packing material Octadecylsilane 5 microns HPLC grade

Mobile phase: 1. At start of chromatographic development:
5% methanol,
95% phosphate buffer (0.023M hexylamine, pH 2.2).
2. 20 minute linear gradient.
3. Final composition: 30% methanol,
70% phosphate buffer.
4. 8 minutes at final composition.
5. End of chromatographic development

Flow rate 1.5 ml per minute

Phosphate buffer 870 parts water
30 parts 2M sodium hydroxide
10 parts phosphoric acid
The hexylamine is added to the buffer after degassing, otherwise it may be lost by evaporation. The final pH is obtained by further addition of sodium hydroxide or phosphoric acid as appropriate.

Detection

(1) Two UV detectors in series at 218 nm and 228 nm.

(2) Photodiode array detector. Both signals on the photodiode array detector are time programmed so that the wavelength is switched 12 minutes after the beginning of the run.

Signal A: Detection first at 218 nm, then at 228 nm.
Signal B: Detection first at 228 nm, then at 240 nm.

1. Standard solution

Accurately weigh into a 100 ml volumetric flask 1.0 mg each of O^3-monoacetylmorphine sulfamate,* noscapine base, and papaverine base; 1.5 mg of O^6-monoacetylmorphine base, 3.0 mg of acetylcodeine base and 90 mg of heroin base. Prior to dilution with injection solvent, piperonal is added to give a final concentration of internal standard of 0.02 mg/ml. 50 microlitres are injected into the liquid chromatograph.

*The form, base or salt, or the choice of salt for the standard materials is unimportant.

2. Sample preparation

For heroin samples, weigh into a volumetric flask an equivalent amount of heroin base which would result in an approximate heroin concentration of 0.09 mg/ml after dilution to volume. Prior to dilution to volume in the injection solvent, piperonal (internal standard) is added to give a final concentration of internal standard of 0.02 mg/ml. Subsequent to 50 microlitre injections into the liquid chromatograph, heroin and selected basic impurities are determined via peak height or area using single point calibration.

Injection solvent:	Acetonitrile	10%
	Water	89%
	Acetic acid	1%

The solution should have a pH of 3.7.

This solvent mixture has been carefully chosen to prevent hydrolysis of heroin to O^6-monoacetylmorphine, and yet overcome distortion of peaks obtained in the chromatography for some common adulterants e.g. procaine, found in samples of trafficked heroin within the developed countries.

Alternative HPLC methods for the analysis of heroin:

1. Journal of Chromatography, Vol 265, 1983, pp 293-300.
2. Journal of Chromatography, Vol 104, 1975, pp 205-210.

INFRA-RED SPECTROSCOPY OF HEROIN

Sample preparation

1. Halide disk method.

The finely powdered dry material, about 2 mg, is mixed with an alkali halide, about 200 mg, ground either mechanically in an agate ball mill or by hand in an agate mortar, and pressed into a thin disk. The ideal is to produce a disc as near to transparent as possible.
Originally, potassium bromide was used as the alkali halide, and the technique is often referred to as the "KBr disc method".
Potassium.chloride has also been widely used and is often considered to be superior to potassium bromide because it is less hygroscopic. Whatever halide is used, it should be.preferably of "IR standard", dried at 105°C for a minimum of one hour and stored above a strong dessicant (e.g. phosphorus pentoxide) in a dessicator. Analytical grade halides, powdered to the same degree as "IR standard" material and dried to the same degree, are acceptable.

The major disadvantage of this method is the need for disc pressing equipment. However, at present time, a number of commercially available disc pressing systems are very inexpensive relative the the cost of an IR spectrophotometer. The other disadvantage is the possible production of an erroneous spectrum produced if double decomposition occurs during the preparation of the disc:

Base.HCl + KBr ------ Base.HBr + KCl

Hydrochlorides should, therefore, always be examined in potassium chloride and not potassium bromide. The anion test using precipitating reagents should preceed IR spectroscopy.

The major advantage of the halide disk method is that provided the halide dispersant is free of water, it should contribute no interference to the resulting spectrum. Another minor advantage is that, with care, the discs may be stored indefinitely. This may be important in any subsequent legal proceeding. Also, the material under investigation can be recovered from the halide disc for further testing.

2. Micro halide disc method.

There are commercially available dies which can produce a halide disc only 1 mm in diameter. In this case the quantity of halide has to be drastically reduced (approximately 1 mg). The use of this technique finds most application in the IR examination of unknown components that have been eluted from TLC plates or HPLC systems. It may also be used if the analyst disposes less than 1 mg of sample.

3. Nujol mull method (liquid parafin method)

The finely powdered sample (2-3 mg) is mixed with one drop of the liquid paraffin and ground in an agate mortar. Sufficient liquid is then added so that the final mull is the consistency of a thin cream. The mull is spread on an alkali halide disc, usually NaCl or KBr and a similar disc placed on top. The film between the halide discs should contain no air bubbles.

The obvious disadvantage of this method is the interference from the paraffin liquid in the IR spectrum. The advantage is that the only apparatus required are a mortar and pestle and a pair of halide discs.

RESULTS

Major peaks occur in the IR spectra of heroin and related compounds at the following wavenumbers (cm^{-1}). They are listed in order of magnitude of absorbance. But the sequence may vary from sample to sample (Halide disc method):

HEROIN

Base: 1243, 1196, 1727, 1214, 1444, 1757, 1054, 1370.
HCl: 1245, 1736, 1177, 1194, 1448, 1765, 1157, 1368.

MORPHINE

Base: 802, 1244, 1445, 1117, 941, 1468, 759, 1086.
HCl: 1444, 1224, 787, 1409, 1449, 1460, 1076.
SO_4: 1270, 1640, 1520, 1470, 1330, 1120, 1080, 970, 870, 790.

CODEINE

Base: 1059, 1277, 1501, 1116, 797, 1252, 938.
HCL: 1442, 784, 1408, 1456, 1491, 1111, 1123.
SO_4: 1110, 1063, 1039, 1443, 1496, 1267, 612, 784.

O^6-MONACETYLMORPHINE

Base: 1239, 1740, 1018, 1038, 1374, 1459, 1505, 915
HCl: 1240, 1723, 1503, 1039, 1305, 1368, 1465, 805

ACETYLCODEINE
Base: 1238, 1739, 1057, 1277, 1505, 1455, 1290, 1375
HCL: 1241, 1739, 1052, 1509, 1445, 1372, 1118, 910

PAPAVERINE
Base: 1508, 1262, 1239, 1159, 1031, 1141(s), 1438, 1205
HCl: 1510, 1282, 1265(s), 1410, 1435, 1028, 1243, 1148

NOSCAPINE 1759, 1279, 1039, 1504, 1009, 1482, 1261(s), 1085
Base: 1759, 1501, 1275, 1481(s), 1032, 1079, 1222, 1622