



One Step Multi-Drug Screen Test

(Amphetamine, Cocaine, Opiates, THC, Methamphetamine, Benzodiazepines, Barbiturates, Phencyclidine and Methadone)

FOR IN VITRO DIAGNOSTIC USE ONLY

INTENDED USE

The Advanced Quality One Step Multi-Drug Screen Test is a rapid, qualitative, competitive immunoassay for the determination of Drug-of-Abuse (DOA) and/or their metabolites in human urine. The device allows the detection of multiple drugs in one simple step. The Advanced Quality One Step Multi-Drug Screen Test is intended to be used in Professional Medical & Forensic laboratories.

This test provides only preliminary data which should be confirmed by other methods such as gas chromatography / mass spectrophotometry (GC/MS). This test is not intended to monitor drug levels, but only to screen urine for the presence of the drugs mentioned and their metabolites.

SUMMARY AND EXPLANATION OF THE TEST

The Advanced Quality One Step Multi-Drug Screen Test employs unique antibodies to selectively identify the following drugs of abuse and/or their metabolites in urine with high degree of sensitivity and specificity:

AMPHETAMINES are central nervous system stimulants that produce alertness, wakefulness, increased energy, reduced hunger, and an overall feeling of well being. Large doses of Amphetamine could cause the development of tolerances and physiological dependency and lead to its abuse. SAMHSA (NIDA) recommended cutoff level for Amphetamine screening tests is 500 ng/ml in urine.

COCAINE is derived from the leaves of the cocoa plant and is a potent central nervous system stimulant as well as a local anesthetic. Some of the psychological effects induced by Cocaine are: euphoria, confidence and sense of increased energy, accompanied by increased heart rate, dilation of the pupils, fever, tremors and sweating. Continued ingestion of Cocaine could induce tolerances and physiological dependency that lead to its abuse. Cocaine is excreted in the urine primarily as Benzoyllecgonine within a short period of time. Benzoyllecgonine has a biological half-life of 5 to 8 hours, which is much longer than that of Cocaine (0.5 to 1.5 hours), and can be generally detected for 24-60 hours after cocaine use or exposure. SAMHSA (NIDA) recommended cutoff level for Benzoyllecgonine screening tests is 300 ng/ml in urine.

OPIATES (Morphine) have been a preferred drug for the management of pain in advanced cancer. Large doses of Morphine could cause the development of tolerances and physiological dependency and lead to its abuse. Morphine and its metabolites detected in urine may be present as a result of Heroin, Morphine, Codeine, or poppy seed intake. SAMHSA (NIDA) recommended cutoff level for Opiates screening tests is 300 ng/ml in urine.

THC (Marijuana) is a hallucinogenic agent derived from the flowering portion of the hemp plant. Smoking is the primary method of use of marijuana. Cannabinoids have been proposed for therapy for acute glaucoma and parsea due to chemotherapy. Higher doses used by abusers produce central nervous system effects, altered mood and sensory perceptions, loss of coordination, impaired short term memory, anxiety, paranoia, depression, confusion, hallucinations and increased heart rate. A tolerance to the cardiac and psychotropic effects can occur, and withdrawal syndrome

produces restlessness, insomnia, anorexia and nausea. When marijuana is ingested, the drug is metabolized by the liver. The primary urinary metabolite of marijuana is 11-nor- Δ -9-tetrahydrocannabinol-9-carboxylic acid and its glucuronide. The presence of Cannabinoids, including the primary carboxyl metabolite, in urine indicates marijuana use. All cannabinoids are controlled substances, and the SAMHSA (NIDA) recommended cutoff level for cannabinoid screening tests is 50 ng/ml in urine.

METHAMPHETAMINE is a potent sympathomimetic agent with therapeutic applications. Acute higher doses lead to enhanced stimulation of the central nervous system and induce euphoria, alertness, and a sense of increased energy and power. Large doses of methamphetamine could cause the development of tolerances and physiological dependency and lead to its abuse. SAMHSA (NIDA) recommended cutoff level for Methamphetamine screening tests is 500 ng/ml in urine.

BENZODIAZEPINES are therapeutically used for anxiolytic, hypnotic, anticonvulsant, and muscle relaxant effects. Acute higher doses lead to drowsiness, dizziness, muscle relaxation, lethargy and even coma. Many of the benzodiazepines share a common metabolic route, and are excreted as oxazepam and its glucuronide in urine. Thus the presence of the oxazepam in the urine indicates parent benzodiazepines use. SAMHSA (NIDA) recommended cutoff level for Benzodiazepines screening tests is 300 ng/ml in urine.

BARBITURATES are a group of prescription drugs that are frequently abused. An acute higher dose induces exhilaration, sedation and respiratory depression. More acute responses produce respiratory collapse and coma. Barbiturates are excreted in the urine in unchanged forms, hydroxylated derivatives, carboxylated derivatives, and glucuronide conjugates. The presence of Barbiturates in the urine indicates Barbiturates use in the past 24 to 48 hours. Urinary concentrations are dependent on the time of sample collection and frequency of drug use. SAMHSA (NIDA) recommended cutoff level for Barbiturates screening tests is 300 ng/ml in urine.

PCP is a hallucinogen which has stimulant, depressant, hallucinogenic, and analgesic properties. PCP is administered by oral or nasal ingestion, smoking, or intravenous injection. Even moderate amounts of PCP, from 5 to 100 ng/ml, can result in psychotic, violent and self-destruction. At high dose, from 100 to 500 ng/ml or higher, PCP can cause convulsions, hypertension, prolonged coma, absent peripheral sensations, and even death. PCP is metabolized via hydroxylation, oxidation, and conjugation with glucuronic acid in the liver. A relatively small portion (4 to 19 %) of the original does is excreted unchanged as PCP in the urine. PCP levels in urine are pH-dependent. Excretion of PCP from body is greatly increased by acidification of the urine.

METHADONE is a prescription drug that can also be abused. Acute higher doses induce analgesia, sedation, respiratory de-pression, and coma. Methadone is excreted in the urine in unchanged forms, di-phenylpyrrodine derivatives, methadol, normethadol and conjugates. The Advanced Quality One Step Methadone Test is based on the principle of the highly specific immunochemical reactions of antigens and antibodies that are used for the analysis of specific compounds in biological fluids.

PRINCIPLE OF THE PROCEDURE

The Advanced Quality One Step Multi-Drug Screen Test card is a device composed of 2-6 chromatographic strips designed to detect 2-6(as per the format) individual drugs of abuse. Each strip consists of a sample pad treated with antibody colloidal gold conjugate and membrane treated with drug conjugate and control reagent. Urine sample initially reacts with the antibody gold conjugate, and then migrates up the strip, by capillary action, to the test area. If sufficient drug is present in the urine, it binds with the conjugate, preventing it from binding to the drug conjugate immobilized on the membrane in the test region. Any unbound conjugate continues to migrate up the strip to the control region where it binds to the control reagent producing a pink/purple band. The control band indicates that the result is valid.

A negative specimen produces two (2) distinct color lines, one in the test area and one in the control area.

A positive specimen produces only one (1) color line in the control area.

REAGENTS AND MATERIALS SUPPLIED

1. Test cards individually foil pouched with a desiccant
2. Urine cups
3. Package insert

MATERIALS REQUIRED BUT NOT PROVIDED

1. Clock or Timer
2. Positive and negative urine controls available from commercial distributors.

WARNINGS AND PRECAUTIONS

1. For in vitro diagnostic use only.
2. For professional Medical and Forensic use only.
3. Do not use the kit beyond the expiration date imprinted on the outside of the foil pouch.
4. Do not open the foil pouch until the urine is collected and ready to be tested.
5. Avoid cross contamination of urine samples by using a new urine sample cup for each sample.
6. Urine specimens may be infectious. Upon completion of all testing dispose of residual urine in an approved manner. Properly handle and dispose of all used reaction devices in a biohazard container.

STORAGE AND STABILITY

The device can be stored under refrigeration or at room temperature (2-30°C) and will be stable until the expiration date.

SAMPLE COLLECTION AND PREPARATION

The sample must be collected in the provided container or any clean dry plastic or glass container of a similar size. Urine specimens may be refrigerated (2-8°C) and stored up to 48 hours, or frozen (-20°C or colder) prior to assaying. If samples are refrigerated or frozen, they should be allowed to come to room temperature before testing. Urine samples exhibiting visible precipitates should be filtered, centrifuged or allowed to settle so that clear aliquots can be obtained for testing.

ASSAY PROCEDURE

1. Bring all materials and specimens to room temperature.
2. Remove test device from the sealed foil pouch.
3. Remove the cap from the device.
4. Immerse the bottom end of the test strips (the sample pads) into urine sample with the arrows pointing toward the specimen. (keep the level of urine sample below the bottom of plastic card or the maximum line marked on the strips.)
5. Hold the device in the urine until a reddish color appears at the lower edge of the test membrane (approximately 10 seconds).
6. Withdraw the device from urine sample, and replace the cover.
7. Read results between 3 - 8 minutes.



READING THE TEST RESULTS

Read Test results between 3 and 8 minutes. Do not interpret results after 8 minutes.

Read and record the results for each individual drug as follows:

Negative: Two (2) pink/purple bands form. In addition to the control band, a pink/purple band also appears in the test region.

Note: This immunoassay is a screening test. A negative result indicates the drug level is below the detection sensitivity. It is important to understand that concentrations of the drug below cut off may cause a faint "ghost line" to form in the test region. This "ghost line" should be considered a negative result.

Positive: One (1) pink/purple band appears in the control region. No band is found in the test region. This is an indication that the drug level is above the detection sensitivity level.

Invalid: If there are no distinct color bands in either the test or control region of the device, the test result is invalid. Retest the sample using a new device.

Clinical consideration and professional judgment should be applied to any drug of abuse test result, particularly when results are positive. Positive results should be confirmed by an alternate method such as GC/MS.

QUALITY CONTROL

1. Each strip has its own control band to indicate that the test is adequately performed. Any invalid result must be repeated using a new Advanced Quality Test Card.
2. Good laboratory practice recommends the use of positive and drug free urine controls to validate reagent performance and establish test reliability. Commercial drug urine controls are available to assess the performance of this device.

WARNING

Urine specimens may be infectious. Upon completion of all testing discard the residual urine in an approved manner. Properly handle and dispose of all used devices in a biohazard container.

PERFORMANCE CHARACTERISTICS

Sensitivity

The Advanced Quality One step Multi-Drug Screen Tests have been individually assayed using a comparable reference screen. The compounds detected by this assay have been identified and the levels that produce positive result are listed below. GC/MS testing must be performed to confirm a positive result.

Compounds Detected by The Advanced Quality DOA Tests:

<u>NAMES OF COMPOUND</u>	<u>LEVELS OF REACTIVITY</u>
AMPHETAMINES:	
d-Amphetamine	500 ng/ml
l-Amphetamine	25 µg/ml
d,l-Amphetamine	625 ng/ml
(±)3,4-Methylenedioxyamphetamine	1 µg/ml
(±) Phenylpropanolamine (PPA)	4 µg/ml
Phentermine	1µg/ml
COCAINE:	
Benzoylcegonine	300 ng/ml
Cocaine	15 µg/ml

Ecgonine	100 µg/ml
Tropacocaine	100 µg/ml

OPIATES:

Morphine	300 ng/ml
Morphine-3-d-glucuronide	300 ng/ml
Hydromorphone	300 ng/ml
Nalorphine	300 ng/ml
Codeine	500 ng/ml
Ethylmorphine	500 ng/ml
Hydrocodone bitartrate	1000 ng/ml
Norcodeine	2000 ng/ml
Normorphine	3700 ng/ml
Oxycodone	2500 ng/ml
Heroin	4000 ng/ml
Naloxone	6000 ng/ml
Thebaine	5000 ng/ml

THC:

11-nor-Δ ⁹ -THC-9-carboxylic acid	50 ng/ml
11-nor-Δ ⁸ -THC-9-carboxylic acid	50 ng/ml
Δ ⁸ -THC	1800 ng/ml
Δ ⁹ -THC	2000 ng/ml
Cannabinol	5000 g/ml
11-hydroxy- Δ ⁹ -THC	10 µg/ml
11-hydroxy- Δ ⁸ -THC	10 µg/ml

METHAMPHETAMINE:

(+) Methamphetamine	500 ng/ml
(±) Methamphetamine	1.0 µg/ml
(±) 3,4-Methylenedioxyamphetamine	1.0 µg/ml
(±) 3,4-Methylenedioxyamphetamine	10 µg/ml
d-amphetamine	5 µg/ml
d,l-amphetamine	10 µg/ml
Ephedrine	25 µg/ml
Pseudoephedrine	10 µg/ml
Phenylpropanolamine (PPA)	50 µg/ml

BENZODIAZEPINES:

Oxazepam	300 ng/ml
α Hydroxyalprazolam	300 ng/ml
α Hydroxyaltriazolam	300 ng/ml
Alprazolam	100 ng/ml
Bromazepam	400 ng/ml

Clobazam	3000 ng/ml
Clonazepam	1000 ng/ml
Clorazepate	100 ng/ml
Desmethyldiazepam	100 ng/ml
Diazepam	100 ng/ml
Flunitrazepam	400 ng/ml
Flurazepam	150 ng/ml
Lorazepam	300 ng/ml
Lormetazepam	400 ng/ml
Medazepam	1500 ng/ml
Nitrazepam	400 ng/ml
Nordiazepam	300 ng/ml
Prazepam	150 ng/ml
Temazepam	300 ng/ml
Triazolam	750 ng/ml

BARBITURATES:

Amobartital	300 ng/ml
Alphenol	150 ng/ml
Aprobarbital	37.5 ng/ml
Barbital	300 ng/ml
Butabarbital	300 ng/ml
Butalbital	75 ng/ml
Phenobarbital	300 ng/ml
Phentobarbital	300 ng/ml
Secobarbital	5 ng/ml
5,5'-diphenylhydantoin	300 ng/ml

PHENCYCLIDINE

Phencyclidine	25ng/ml
Naloxone	20µg/ml

METHADONE:

(±) Methadone	300 ng/ml
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Specificity and Interfering substances

The following substances did not interfere with the Advanced Quality DOA Tests.

Glucose	2000mg/dl	Uric Acid	10 mg/dl
Human Albumin	2000mg/dl	Urea	4000mg/dl
Hemoglobin	10mg/dl	Bilirubin	2 mg/dl

Compounds that give negative result for Amphetamine test at concentrations up to 100 µg/ml (unless noted):

4-acetamidolphenol	Lidocaine
Acetylsalicylic Acid	Morphine
Amikacin	Methadone
Amitriptyline	Naloxone
Arterenol	Neomycin
Aspartame	Niacinamide
Atropine sulfate	11-Nor-8-THC-9-COOH(10µg/ml)
Benzoylcegonine	11-Nor-9-THC-9-COOH(10µg/ml)
Caffeine	Perphenazine
Camphor	Phencyclidine
Chloroquine	Phenobarbital
Chorpheniramine	Phenylethylamine-a
Cortisone	Phencylidine
Deoxyepinephrine	Promoethazin
Dextromethorphan	Pseudoephedrine
Digitoxin	Rantidine
Digoxin	Salicylic acid
Epinephrine(±)	Secobarbital
Glucose	Tetrahydrozoline
Guaiacol glyceryl ether	Tetracycline
Histamine	Theophylline
Homatropine	Thioridazine
Imipramine	Trifluoperazine
Ketamine	

Compounds that give negative results for Cocaine Test at concentrations up to 100 µg/ml (unless noted):

4-Acetamidolphenol	Ketamine
Acetylsalicylic Acid	Lidocaine
Amikacin	Meperidine(200µg/ml)
Amitriptyline	Methadone
Amphetamine	Methamphetamine
Arterenol	3,4-Methyldioxymethamphetamine
Aspartame	Neomycin
Ethyl-p-aminobenzoate	Niacinamide
Camphor	11-Nor-9-THC-9-COOH (10µg/ml)
Chloroquine	Oxazepam
Chorpheniramine	Perphenazine
Cortisone	Phencyclidine
Deoxyepinephrine	Phenobarbital
Dextromethorphan	Phenylethylamine-a
Digitoxin	Phenylpropanolamine
Digoxin	Promoethazine
Epinephrine	Pseudoephedrine
Ephedrine	Rantidine
Gentisic acid	Salicylic acid
Guaiacol glyceryl ether	Secobarbital
Imipramine	Tetrahydrozoline
Isoproterenol	Tetracycline
Histamine	Theophylline
Homatropine	Thioridazine
Isoproterenol	Trifluoperazine

Compounds that give negative results for Opiates Test at concentrations up to 100 µg/ml (unless noted):

4-Acetamidolphenol	Ketamine
Acetylsalicylic Acid	Lidocaine
Amikacin	Meperidine(200µg/ml)
Amitriptyline	Methadone
Amphetamine	Methamphetamine
Arterenol	3,4-ethylenedioxymethamphetamine
Aspartame	Neomycin
Benzoylcegonine	Niacinamide
Caffeine	11-Nor-8-THC-9-COOH(10µg/ml)
Camphor	11-Nor-9-THC-9-COOH(10µg/ml)
Chloroquine	Oxazepam
Chorpheniramine	Perphenazine
Cortisone	Phencyclidine
Deoxyepinephrine	Phenobarbital
Dextromethorphan	Phenylethylamine-a
Digitoxin	Phenylpropanolamine
Digoxin	Promoethazine
Epinephrine	Pseudoephedrine
Ephedrine	Rantidine
Gentisic acid	Salicylic acid
Glucose	Secobarbital
Guaiacol glyceryl ether	Tetracycline
Histamine	Tetrahydrozoline
Imipramine	Theophylline
Isoproterenol	Thioridazine
Imipramine	Trifluoperazine

Compounds that give negative result for THC Test at concentrations up to 100 µg/ml (unless noted):

Acetaminophen	Ketamine
4-Acetamidolphenol	d-methamphetamine
Acetylsalicylic Acid	Meperidine(200µg/ml)
Amikacin	Methadone
Amitriptyline	d,l-methamphetamine
d,l-amphetamine	Morphine
Arterenol	Naloxone
Aspartame	Niacinamide
Ampiciline	Neomycin
Atropine Sulfate	11-nor-8-THC-9-COOH(10µg/mL)
Benzoylcegonine	11-nor-9-THC-9-COOH(10µg/mL)
Benzoyic Acid	Oxazepam
Caffeine	Phenobarbital
Camphor	Perphenazine
Chloroquine	Phencyclidine
Chorpheniramine	Phenylpropanolamine
Cortisone	Promoethazine
Cimetidine	Pseudoephedrine
Deoxyepinephrine	Rantidine
Dextromethorphan	Salicylic acid
Digitoxin	Secobarbital
Gentisic acid	Tetracycline
Glucose	Tetrahydrozoline

Guaiacol glyceryl ether	Theophylline
Histamine	Thioridazine
Hydromorphone	Trifluoperazine
	Tryptophan

Compounds that give negative result for Methamphetamine Test at concentrations up to 100 µg/ml (unless noted):

4-acetamidophenol	Ketamine
Acetylsalicylic Acid	Lidocaine
Amikacin	Morphine
Amitriptyline	Methadone
Arterenol	Naloxone
Aspartame	Neomycin
Atropine sulfate	Niacinamide
Benzoylcegonine	11-Nor-8-THC-9-COOH(10µg/ml)
Caffeine	11-Nor-9-THC-9-COOH(10µg/ml)
Camphor	Perphenazine
Chloroquine	Phencyclidine
Chorpheniramine	Phenobarbital
Cortisone	Phenylethylamine-a
Deoxyepinephrine	Phencylidine
Dextromethorphan	Promoethazine
Digitoxin	Pseudoephedrine
Digoxin	Rantidine
Epinephrine(±)	Salicylic acid
Glucose	Secobarbital
Guaiacol glyceryl ether	Tetrahydrozoline
Imipramine	Tetracycline
Isoproterenol	Theophylline
Histamine	Thioridazine
Homatropine	Trifluoperazine

Compounds that give negative result for Benzodiazepines Test at concentrations up to 100 µg/ml (unless noted):

Acetamidophenol	Isoproterenol
Acetylsalicylic Acid	Ketamine
Amikacin	Lidocaine
Amitriptyline	Morphine
d,l-amphetamine	Methadone
Arterenol	Methamphetamine
Aspartame	Naloxone
Atropine sulfate	Neomycin
Caffeine	11-Nor-8-THC-9-COOH(10µg/ml)
Camphor	11-Nor-9-THC-9-COOH(10µg/ml)
Chorpheniramine	Perphenazine
Chloroquine	Phencyclidine
Cortisone	Phenobarbital
Deoxyepinephrine	Phenylethylamine-a
Dextromethorphan	Phenylpropanolamine
Digitoxin	Promoethazine
Digoxin	Rantidine
Ephedrine	Salicylic acid
Gentisic acid	Secobarbital
Glucose	Tetrahydrozoline
Guaiacol glyceryl ether	Tetracycline
Histamine	Theophylline

Homatropine	Thioridazine
Imipramine	Trifluoperazine

Compounds that give negative result for Barbiturates Test at concentrations up to 100 µg/ml (unless noted):

acetamidophenol	imipramine
acetylsalicylic acid	isoproterenol
amikacin	ketamine
amitriptyline	lidocaine
d,l-amphetamine	methadone
arterenol	methamphetamine
aspartame	morphine
atropine	sulfate naloxone
benzoylcegonine	neomycin
caffeine	niacinamide
camphor	11-nor-8-THC-9-COOH (10 ng/ml)
chloroquine	11-nor-9-THC-COOH (10 ng/ml)
chlorpheniramine	oxazepam
cocaine	perphenazine
cortisone	phencyclidine phenylethylamine-a
deoxyepinephrine	phenylpropanolamine
dextromethorphan	promethazine
digitoxin	pseudoephedrine
digoxin	rantidine
epinephrine (±)	salicylic acid
ephedrine	tetracycline
gentisic acid	tetrahydrozoline
glucose	theophylline
histamine	thioridazine
guaiacol glyceryl ether	trifluoperazine.
homatropine	

Compounds that give negative results at concentration up to 100 µg/ml (unless noted):

4-acetamidophenol	ketamine
acetylsalicylic acid	lidocaine
amikacin	methadone
amitriptyline	methamphetamine
amphetamine	morphine
arterenol	3,4-methylenedioxymethamphetamine
aspartame	neomycin
benzoylcegonine	niacinamide
caffeine	11-nor-delta-8-THC-9-COOH (10 µg/ml)
camphor	11-nor-delta-9-THC-9-COOH(10 ug/ml)
chloroquine	oxazepam
chlorpheniramine	perphenazine
cortisone	phenobarbital
deoxyepinephrine	phenylethylamine-α
dextromethorphan	phenylpropanolamine
digitoxin	promethazine
digoxin	pseudoephedrine
epinephrine (±)	rantidine
ephedrine	salicylic acid
gentisic acid	secobarbital
glucose	tetracycline
histamine	

guaiacol glyceryl ether	tetrahydrozoline
imipramine	theophylline
isoproterenol	thioridazine
	trifluoperazine

Compounds that give negative results for Methadone Test at concentrations up to 100 µg/ml (unless noted):

4-acetamidophenol	ketamine
acetylsalicylic acid	lidocaine
amikacin	meperidine
amitriptyline	methamphetamine
d,l-amphetamine	morphine
arterenol	naloxane
aspartame	neomycin
atropine sulfate	niacinamide
benzoyllecgonine	11-nor-delta-8-THC-9-COOH (10 ug/ml)
caffeine	1-nor-delta-THC-COOH (10 ug/ml)
camphor	oxazepam
chlorpheniramine	perphenazine
cortisone	phencyclidine
deoxyepinephrine	phenobarbital
dextromethorphan	phenylethylamine- α
digitoxin	phenylpropanolamine
digoxin	promethazine
(\pm)epinephrine	pseudoephedrine
ephedrine	rantidine
gentisic acid	salicylic acid
glucose	secobarbital
histamine	tetracycline
guaiacol glyceryl ether	tetrahydrozoline
homatropine	theophylline
imipramine	thioridazine
isoproterenol	trifluoperazine

There is a possibility that other factors such as technical or procedural errors, as well as other substances in the urine sample that are not listed above, may interfere with the test and cause erroneous results.

LIMITATIONS OF THE TEST

1. This product is designed to be used for the detection of DOA and/or their metabolites in human urine only.
2. Although the Advanced Quality DOA Test is very accurate in detecting the urine drug levels, there is a possibility of false results due to the presence of interfering substances in the urine.
3. The test is a qualitative screening assay and is not suggested for determining the quantitative level of DOA in urine.
4. Adulterants, such as bleach or other strong oxidizing agents, when added to urine specimens, may produce erroneous test results regardless of the analysis method used. If adulteration is suspected, obtain another urine specimen.

BIBLIOGRAPHY

1. Ambre, J.J., Anal. Toxicol., 9;241-5, (1985).
2. Baselt, R.C., Disposition of Toxic Drugs and Chemicals in Man, 2nd Ed., Biomedical Publ., Davis, CA, p. 488, 1982.
3. Huang, W., Andollo, W., and Hearn W.L., J. Anal. Toxicol., 16: 307-310 (1992).
4. Cone, E.J., Dickerson, S., Paul, B.D., and Mitchell, J.M., J. Anal. Toxicol., 17: 156-164 (1993).

5. Glare, P.A., Walsh, T.D., and Pippenger, C.E., Therapeutic Drug Monitoring, 13: 226-232 (1991).
6. Walsh, T. D., and Cheater, F.M., Pharmaceutical J., 10: 525527 (1983).
7. Mitchell, J.M., Paul, B.D., Welsh, P., and Cone, E.J., J. Anal. Toxicol., 15: 49-53 (1991).
8. Tietz, Norbert W., Textbook of Chemistry, W.B. Saunders Company, 1986, p. 1735.
9. Stewart, D.J., Inoba T., Ducassen, M., and Kalow, W., Clin. Pharmacol. Ther. 25:264 (1979).
10. Department of Health and Human Services, Fed. Regist., 53: (69): 11970-11989 (1988).
11. Urine Testing for Drugs of Abuse, NIDA, Research Monograph 73, 1986

