HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS: TOXICOLOGIC AND FORENSIC TRACE ANALYSIS

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HRGC/HPLC-MS COUPLINGS

HRGC/HPLC-MS couplings combine sinergetically:

• The chromatographic separative potential (GC, HPLC and electrophoresis) with...
• The unequivocal molecular identification capacity of Mass Spectrometry,...
• To femtomole levels,...
• With great selectivity (through S.I.R),...
• From H₂ until biopolymers, in complex matrices.
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS: TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

IN TOXICOLOGY AND FORENSICS

- Alcohols and solvents,
- Drugs,
- Intoxications,
- Post mortem,...

In:
  - Biological fluids (blood, urine, saliva, sweat, gastrical washing, etc.)
  - Textiles (including hair)
BASIC EXIGENCES IN TOXICOLOGICAL ANALYSIS:

- Guaranteeing sample integrity (elimination of appliance/device formation)
- Rigorous manipulation of micro-samples, preparation and sample introduction into the analytical systems
- Rapidity and fiability in the qualitative and quantitative analysis
- Structure Identification of any substance at microtrace levels
KONIK EQUIPMENTS DESIGNED FOR OPTIMAL ANALYSIS IN TOXICOLOGY AND FORENSICS

- Konik HRGC 4000 B *Peak Power*
- Konik HPLC KIS-20
- Konik K-MAS5 Multimode Autosampler (HS, P&T, SPµE)
- Konik KMASS-11 Mass Spectrometer (K4000+K500+ K-MAS5+KMASS-11)
HRGC/HPLC-MS APPLICATIONS IN:

Toxicology and Forensics:

- Alcohol level in blood (ethanol, acetone, methanol, isopropanol,...)
- Amphetamines (metamphetamine, extasis, speed, ...)
- Anestesicals (lidocaine, procaine, tetracaine,...)
- Tricycles Antidepressives (diazepam, clorazepam,...)
- Barbituricals (pheno, alo, buta, pentobarbital,...)
- Cannabinoids (Δ9-THC, THCA, ...)
- Cocaine (norcocaine,...)
- Solvents (bencene, toluene, ...)
- LSD (Lysergic acid)
- Opiates (heroine, morfine, methadone, codeine, ...)

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OTHER RELATED APPLICATIONS :

- Anabolics and hormones (sport medicine, veterinary medicine,...)
- Diuretics (blood tonic/purifying medicine)
- Explosives (criminalistics, terrorism,...)
- Fires (criminalistics, insurances,...)
- Nicotine (insurances, civil responsibility,...)
- Environmental Toxics (industrial hygiene,...)
- Stimulants (caffeine, theobromine,...)
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS:
TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

Cocaine
- Formula: C_{17}H_{21}NO_{3}
- Molecular Weight: 303.35
- CAS Registry Number: 50-36-2
- Chemical Structure:
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS: TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

COCaine IN URINE

Standards in Methanol

Spiked Urine

Urine Blank
MORPHINE

Morphine

- Formula: C_{17}H_{19}NO_{3}
- Molecular Weight: 285.34
- CAS Registry Number: 57-27-2
- Chemical Structure:
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS:
TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

Standards in Methanol (direct injection)

1. Ethylamino benzolate
2. Propanol
3. Lidocaine
4. Procaine
5. Mepivacaine
6. Tetracaine
7. Ethylcaine
8. <(Phenylamine)benzoic acid
9. 2-(Ethylammonium) ethanol
10. Benoxinate

ANESTHESICS IN BLOOD

Spiked Blood + NaOH

Spiked Blood + NaOH + (NH₄)₂SO₄

Blood Blank + NaOH + (NH₄)₂SO₄
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS:
TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

GASTRICAL PURGING
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS:
TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

FIRE (WASTES)
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS:
TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

1. Nitrobenzene
2. 2-Nitrotoluene
3. 3-Nitrotoluene
4. 4-Nitrotoluene
5. 2,6 Dinitrotoluene
6. 1,3 Dinitrobenzene
7. 2,4 Dinitrotoluene
8. Trinitrotoluene
9. 1,3,5 Trinitrobenzene
10. 4-Amino-2,6-dinitrotoluene
11. 2-Amino 4,6 dinitrotoluene
12. Tetryl

EXPLOSIVES

KONIK GROUP
Khromatography + Spektrometry
Analytical Solutions + Control
TRICYCLICS
ANTIDEPRESSIVES
IN URINE

Spiked Urine + NaOH

1. Amitriptyline
2. Imipramine
3. Trimipramine
4. Chlorimipramine

Spiked Urine, No NaOH

Urine Blank + NaOH

796 0274 0277

Könik GROUP
Kromatography + Spektrometry
Analytical Solutions + Control
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS:
TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

AMPHETAMINES

Peak Identification
1. Phenylpropanolamine
2. Ephedrine
3. Amphetamine
4. Methamphetamine
5. Methylamphetamine
6. Catecholamine
7. Dextroamphetamine
AMPHETAMINE (TRACE LEVEL)
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS:
TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

Heated Headspace SPME

Conventional Heated Headspace

1. Amphetamine
2. Methamphetamine

AMPHETAMINES IN URINE
HRGC/HPLC/DIP-MASS SPECTROMETRY COMBINED SYSTEMS:
TRACE ANALYSIS IN TOXICOLOGY and FORENSICS

SOLVENTS IN BLOOD and URINE

1. Benzene
2. Butanol
3. n-Butyl acetate
4. n-Butyl benzene (light)
5. n-Butanol
6. n-Butyl acetate
ALCOHOL IN BLOOD

1. Acetone
2. Methanol
3. Isopropanol
4. Ethanol
5. n-Propanol