



# Proficiency Testing Scheme 2009



Gesellschaft für Toxikologische und Forensische Chemie

## Technical Management



ARVECON GmbH  
Kiefernweg 4  
69190 Walldorf  
Germany

Phone + 49 6227 841075

Fax + 49 6227 841076

Email [info@arvecon.de](mailto:info@arvecon.de)

Web [www.arvecon.com](http://www.arvecon.com)

## Scientific Management

Prof. Dr. Rolf Aderjan  
Ruprechts-Karl-University Heidelberg  
Institute of Legal Medicine and Traffic Medicine  
Voss-Strasse 2  
69115 Heidelberg  
Germany

Phone + 49 6221 56 8920

Fax + 49 6221 56 1300

Email [rolf.aderjan@med.uni-heidelberg.de](mailto:rolf.aderjan@med.uni-heidelberg.de) / [aderjan@aderjan.de](mailto:aderjan@aderjan.de)

## Office of the GTFCh

Karl Schmidt  
Landgrabenstrasse 74  
61118 Bad Vilbel  
Germany

Phone + 49 69 6301 7572

Fax + 49 69 6301 7531

Web [www.gtfch.org](http://www.gtfch.org)

## President of the GTFCh

Prof. Dr. Frank Mußhoff  
University Bonn  
Institute of Legal Medicine  
Stiftsplatz 12  
53111 Bonn  
Germany

# Contents

## Drugs of Abuse

Illicit Drugs in Serum	6
Drugs in Urine	7
Drugs in Hair	8
Qualitative Screening Analysis	9

## Therapeutic Drugs

Benzodiazepines in Serum	10
Replacement Drugs in Serum and Urine	11
Tricyclic Antidepressants in Serum	12
Toxicological Analysis of Diagnostics of Brain Death	13
Therapeutic Drug Monitoring - Neuroleptics 1	14
Therapeutic Drug Monitoring - Anticonvulsants	15
Therapeutic Drug Monitoring - Neuroleptics 2	16
Therapeutic Drug Monitoring - Antidepressants	17

## Alcohol

Ethanol in Serum	18
Markers of Alcoholism in Serum	19
Congener Alcohols in Serum	20
Ethylglucuronide in Serum and Urine	21

## Further Proficiency Tests

Amanitine in Urine	22
Homocysteine in Serum	23

## Miscellaneous

Precision criteria	24
Conditions of Participation	26

## Supplement

Order form

## 1. Deadline

For a delay-free operation of the tests and creating of the reports, it is necessary that the results are reported by the deadline indicated.

## 2. Report forms

All report forms are available in German and English language. Normally participants from not German-speaking countries receive all forms in English version. If you want to receive the forms in German language please note this on the registration form.

## 3. Complaints

If your report or certificate contains an error, please send us immediately your objection. If the error is caused by wrong fill-in of the forms, it is not possible to correct the certificate.

## 4. Correspondence

All inquiries by email or post are possible in German, English or French language. Inquiries in other languages will not worked on.

## 5. Evaluation time

At present the evaluation time of the reports is 2 to 4 weeks.

## 6. Sample Content and Volume

The scientific and technical management are entitled to vary the content and the volume of the samples, if they consider this as necessary or advantageous for the respective test.

## 7. Fees

All quotations indicated are net prices plus 19% VAT including postage and packing.

## 8. Payment options

Payment is possible by bank transfer, check or credit card (Mastercard, Visa). Transfer of credit card details can be performed by post, fax or email.



Requirements

Dates

Fees

# Illicit Drugs in Serum

## ■ Material

**Sample A:** Lyophilized serum, 2 x 2.5 mL

**Sample B:** Various topics like: determination of DOA in whole blood, determination of DOA in authentic blood samples or actual requirements. The volume of the samples is fitted to the requirements of the topic.

## ■ Analytes

### sample A

#### Cannabinoids

- $\Delta^9$ -THC
- 11-nor- $\Delta^9$ -carboxy-THC
- 11-hydroxy- $\Delta^9$ -THC

#### Cocaine/-metabolites

- cocaine
- benzoylecgonine
- methylecgonine

#### Opiates

- morphine
- codeine

#### Amphetamines

- amphetamine
- MDMA
- MDE
- MDA
- methamphetamine

The addition of further drugs from corresponding drug classes is possible. The determination of these drugs is optional, the results will not be certified.

## ■ Concentration ranges

- cannabinoids 0 - 250
- cocaine /-metabolites 0 - 750
- opiates 0 - 1000
- amphetamines 0 - 1000

All concentrations expressed as  $\mu\text{g/L}$

## ■ Examinations requested

Identification and quantitative determination of the analytes

## ■ Distributions

### BTMF 1/09

10-Feb - 23-Mar

### BTMF 2/09

16-Jun - 27-Jul

### BTMF 3/09

20-Oct - 30-Nov

## ■ Fees

order no.	description	members	non members
PT-1100	subscription 2009	495.--	695.--
PT-1101	BTMF 1/09	200.--	280.--
PT-1102	BTMF 2/09	200.--	280.--
PT-1103	BTMF 3/09	200.--	280.--
PT-1120	add. samples (1 x A+B)	80.--	90.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

## ■ Material

Lyophilized urine, 2 x 10 mL

## ■ Analytes

5 to 8 DOA, drugs or their metabolites

## ■ Examinations requested

Step 1: Immunological tests (certified with confirmation analysis)

Step 2: confirmation of the positive results of step 1

Step 3: general unknown analysis

We advise to perform all analysis of step 2 and 3 with GC/MS, but we will accept all other methods.

## ■ Distributions

### UF 1/09

27-Jan - 02-Mar

### UF 2/09

19-May - 22-Jun

### UF 3/09

29-Sep - 02-Nov

## ■ Fees

order no.	description	all participants
PT-1200	subscription 2009	240.--
PT-1201	UF 1/09	95.--
PT-1202	UF 2/09	95.--
PT-1203	UF 3/09	95.--
PT-1220	add. sample (10 mL)	45.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Drugs in Hair

## ■ Material

### 2 samples (human hair)

A: Powdered hair with spiked drugs, 250 mg

B: Cut hair of drug user, 250 mg

For the issuing of the certificate until further notice we will use only the results of sample A. In accordance with the scientific management of the proficiency testing and the corresponding work groups of the GTFCh modifications are possible.

## ■ Analytes

- THC
- amphetamine, MDMA, MDA, MDEA
- morphine, MAM
- cocaine, benzoylecgonine

## ■ Concentration ranges

### sample A

- cannabinoids 0 - 100
- amphetamines 0 - 100
- opiates 0 - 100
- cocaine / metabolites 0 - 100

### sample B

authentic drug user hair

All concentrations expressed as ng/mg

## ■ Examinations requested

A: Quantitative determination of the analytes

B: Identification and quantitative determination of drugs

## ■ Distributions

DHF 1/09

17-Mar - 20-Apr

DHF 2/09

23-Jun - 27-Jul

DHF 3/09

20-Oct - 23-Nov

## ■ Fees

order no.	description	all participants
PT-1300	subscription 2009	325.--
PT-1301	DHF 1/09	130.--
PT-1302	DHF 2/09	130.--
PT-1303	DHF 3/09	130.--
PT-1320	add. samples (1 x A+B)	85.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Qualitative Screening Analysis

## ■ Material

Liquid serum, 5 mL

Liquid urine, 10 mL

## ■ Analytes

One or more drugs, with toxicological case history

## ■ Examinations requested

Identification of drugs and interpretation of the results.

## ■ Distributions

**QSA 1/09**

17-Feb - 16-Mar

**QSA 2/09**

09-Jun - 06-Jul

**QSA 3/09**

22-Sep - 19-Oct

## ■ Fees

order no.	description	members	non members
PT-1400	subscription 2009	250.--	300.--
PT-1401	QSA 1/09	100.--	120.--
PT-1402	QSA 2/09	100.--	120.--
PT-1403	QSA 3/09	100.--	120.--
PT-1420	add. samples (1 x S, U)	50.--	55.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Benzodiazepines in Serum

## ■ Material

Lyophilized serum, 2 samples (A + B), each 3 mL

## ■ Analytes

### sample A

- diazepam
- nordiazepam
- bromazepam
- clonazepam
- temazepam
- zolpidem

### sample B

- flunitrazepam
- norflunitrazepam
- 7-aminoflunitrazepam
- oxazepam
- midazolam
- zopiclone

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

### BZF 1/09

20-Jan - 16-Feb

### BZF 2/09

05-May - 02-Jun

### BZF 3/09

01-Sep - 28-Sep

## ■ Fees

order no.	description	members	non members
PT-1500	subscription 2009	250.--	315.--
PT-1501	BZF 1/09	100.--	125.--
PT-1502	BZF 2/09	100.--	125.--
PT-1503	BZF 3/09	100.--	125.--
PT-1520	add. samples (1 x A, B)	55.--	70.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Replacement Drugs in Serum and Urine

## ■ Material

Lyophilized serum, 2.5 mL

Lyophilized urine, 2.5 mL

## ■ Analytes

- buprenorphine
- norbuprenorphine
- methadone
- EDDP

## ■ Concentration ranges

	Serum	Urine
• buprenorphine	1 - 20	0.5 - 100
• norbuprenorphine	2 - 40	0.5 - 150
• methadone	10 - 800	10 - 1000
• EDDP	10 - 800	10 - 1000

All concentrations expressed as µg/L

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

### STM 1/09

27-Jan - 23-Feb

### STM 2/09

05-May - 02-Jun

### STM 3/09

29-Sep - 26-Oct

## ■ Fees

order no.	description	members	non members
PT-1600	subscription 2009	190.--	225.--
PT-1601	STM 1/09	75.--	90.--
PT-1602	STM 2/09	75.--	90.--
PT-1603	STM 3/09	75.--	90.--
PT-1620	add. sample set	45.--	60.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Tricyclic Antidepressants

## ■ Material

Lyophilized serum, 4 samples (A, B, C, D) each 2.5 mL

## ■ Analytes

### sample A / B

- doxepine
- nordoxepine
- amitriptyline
- nortriptyline
- trimipramine

### sample C / D

- imipramine
- desipramine
- clomipramine
- norclomipramine
- maprotiline

## ■ Concentration ranges

all analytes 10 - 1500 µg/L

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

### TCA 1/09

03-Feb - 02-Mar

### TCA 2/09

09-Jun - 06-Jul

### TCA 3/09

06-Oct - 02-Nov

## ■ Fees

order no.	description	members	non members
PT-1700	subscription 2009	250.--	275.--
PT-1701	TCA 1/09	100.--	110.--
PT-1702	TCA 2/09	100.--	110.--
PT-1703	TCA 3/09	100.--	110.--
PT-1720	add. samples (1 x A, B, C, D)	60.--	70.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Toxicological Analysis of Diagnostics of Brain Death

## ■ Material

Lyophilized serum, 2 samples each 2.5 mL

## ■ Analyte

- thiopental
- pentobarbital
- phenobarbital
- methohexital
- midazolam
- diazepam
- nordiazepam
- fentanyl

## ■ Concentration ranges

- thiopental 0.50 - 3.0
- pentobarbital 0.50 - 5.0
- phenobarbital 2.00 - 50.0
- methohexital 0,25 - 3.0
- midazolam 0.02 - 0.5
- diazepam 0.10 - 0.5
- nordiazepam 0.10 - 0.5
- fentanyl 0.001 - 0.01

all concentrations indicated as mg/L

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

**TAB 1/09**

24-Feb - 16-Mar

**TAB 2/09**

25-Aug - 14-Sep

## ■ Fees

order no.	description	all participants
PT-2000	subscription 2009	160.--
PT-2001	TAB 1/09	85.--
PT-2002	TAB 2/09	85.--
PT-2020	add. sample	35.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Therapeutic Drug Monitoring - Neuroleptics 1

## ■ Material

Lyophilized serum, 4 samples (A, B, C, D) each 3 mL

## ■ Analytes

### sample A and B

- clozapine
- N-desmethylclozapine
- olanzapine
- quetiapine
- amisulpride

### sample C and D

- risperidone
- 9-hydroxyrisperidone
- ziprasidone
- citalopram
- perazine

## ■ Concentration ranges

- |                       |            |                        |          |
|-----------------------|------------|------------------------|----------|
| • clozapine           | 100 - 2500 | • risperidone          | 0 - 15   |
| • N-desmethylclozapin | 100 - 1500 | • 9-hydroxyrisperidone | 5 - 150  |
| • olanzapine          | 10 - 100   | • perazine             | 25 - 600 |
| • quetiapine          | 25 - 600   | • ziprasidone          | 10 - 150 |
| • amisulpride         | 50 - 500   | • citalopram           | 10 - 300 |

all concentrations indicated as µg/L

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

### TDMA 1/09

03-Mar - 30-Mar

### TDMA 2/09

16-Jun - 13-Jul

### TDMA 3/09

13-Oct - 09-Nov

## ■ Fees

order no.	description	members	non members
PT-1900	subscription 2009	250.--	285.--
PT-1901	TDMA 1/09	100.--	115.--
PT-1902	TDMA 2/09	100.--	115.--
PT-1903	TDMA 3/09	100.--	115.--
PT-1920	add. samples (1 x A, B, C, D)	55.--	65.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Therapeutic Drug Monitoring - Anticonvulsants

## ■ Material

Lyophilized serum, 2 samples (A, B) each 4 mL (2 x 2 mL oder 1 x 4 mL)

## ■ Analytes

### sample A and B

- carbamazepine
- felbamate
- gabapentine
- levetiracetam
- oxcarbazepine
- 10-OH-carbamazepine
- pregabalin
- tiagabine
- topiramate
- vigabatrine

## ■ Concentration ranges

- carbamazepine 1 - 10
- felbamate 100 - 1500
- gabapentine 10 - 100
- levetiracetam 25 - 600
- oxcarbazepine 25 - 600
- 10-OH-carbamazepine 0 - 15
- pregabalin 5 - 150
- tiagabine 50 - 500
- topiramate 10 - 150
- vigabatrine 10 - 300

all concentrations indicated as mg/L

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

### TDMB 1/09

10-Mar - 06-Apr

### TDMB 2/09

23-Jun - 20-Jul

### TDMB 3/09

20-Oct - 16-Nov

## ■ Fees

order no.	description	members	non members
PT-3200	subscription 2009	250.--	285.--
PT-3201	TDMB 1/09	100.--	115.--
PT-3202	TDMB 2/09	100.--	115.--
PT-3203	TDMB 3/09	100.--	115.--
PT-3220	add. samples	50.--	60.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Therapeutic Drug Monitoring - Neuroleptics 2

## ■ Material

Lyophilized serum, 2 samples (A, B) each 4 mL (2 x 2 mL oder 1 x 4 mL)

## ■ Analytes

### sample A and B

- aripiprazol
- flupentixol
- fluphenazin
- haloperidol
- sertinol
- sulphirid
- zotepine

## ■ Concentration ranges

- aripiprazol 0.5 - 5.0
- flupentixol 1.0 - 150.0
- fluphenazin 1.0 - 50.0
- haloperidol 2.0 - 50.0
- sertinol 1.0 - 25.0
- sulphirid 0.025 - 0.75
- zotepine 0.01 - 0.20

all concentrations indicated as mg/L

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

### TDMC 1/09

17-Mar - 14-Apr

### TDMC 2/09

30-Jun - 27-Jul

### TDMC 3/09

27-Oct - 23-Nov

## ■ Fees

order no.	description	members	non members
PT-3100	subscription 2009	250.--	285.--
PT-3101	TDMC 1/09	100.--	115.--
PT-3102	TDMC 2/09	100.--	115.--
PT-3103	TDMC 3/09	100.--	115.--
PT-3120	add. samples (1 x A, B)	55.--	65.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Therapeutic Drug Monitoring - Antidepressants

## ■ Material

Lyophilized serum, 2 samples (A, B) each 4 mL (2 x 2 mL oder 1 x 4 mL)

## ■ Analytes

### sample A and B

- duloxetine
- fluoxetine
- fluvoxamine
- mianserine
- mirtazapine
- paroxetine
- reboxetine
- sertraline
- venlafaxine
- desmethylvenlafaxine

## ■ Concentration ranges

- duloxetine 10 - 125
- fluoxetine 25 - 1000
- fluvoxamine 25 - 250
- mianserine 10 - 250
- mirtazapine 25 - 250
- paroxetine 10 - 150
- reboxetine 25 - 250
- sertraline 20 - 300
- venlafaxine 25 - 400
- desmethylvenlafaxine 25 - 400

all concentrations indicated as µg/L

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

### TDMD 1/09

24-Mar - 20-Apr

### TDMD 2/09

07-Jul - 03-Aug

### TDMD 3/09

10-Nov - 07-Dec

## ■ Fees

order no.	description	members	non members
PT-3000	subscription 2009	250.--	285.--
PT-3001	TDMD 1/09	100.--	115.--
PT-3002	TDMD 2/09	100.--	115.--
PT-3003	TDMD 3/09	100.--	115.--
PT-3020	add. samples (1 x A, B)	55.--	65.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Ethanol in Serum

## ■ Material

Liquid serum, 2 samples (A + B), each 2.5 mL

## ■ Analyt

ethanol

## ■ Examinations requested

Quantitative determination of ethanol according to the guidelines of the BGA (Bundesgesundheitsamt), including two determinations with each GC- and ADH-method.

### Precision - single method (GC or ADH)

mean < 1.0 g/L ⇒ range of variation < 0.1 g/L

mean > 1.0 g/L ⇒ range of variation < 10 %

### Trueness - single methods or combination (GC/ADH)

mean < 1.0 g/L ⇒ mean ± 0.05 g/L

mean > 1.0 g/L ⇒ mean ± 5%

## ■ Distributions

### ETOH 1/09

13-Jan - 02-Feb

### ETOH 2/09

21-Apr - 13-May

### ETOH 3/09

30-Jun - 20-Jul

### ETOH 4/09

06-Oct - 26-Oct

## ■ Fees

order no.	description	members	non members
PT-2100	subscription 2009	210.--	250.--
PT-2101	ETOH 1/09	60.--	70.--
PT-2102	ETOH 2/09	60.--	70.--
PT-2103	ETOH 3/09	60.--	70.--
PT-2104	ETOH 4/09	60.--	70.--
PT-2120	add. samples (1 x A u. B)	35.--	50.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Markers of Alcoholism in Serum

## ■ Material

Authentic lyophilized serum, 2 samples (A +B), each 1.0 mL

## ■ Analytes

CDT

## ■ Examinations requested

Quantitative determination of CDT and interpretation of the results

## ■ Distributions

### AMF 1/09

03-Feb - 02-Mar

### AMF 2/09

19-May - 15-Jun

### AMF 3/09

25-Aug - 21-Sep

### AMF 4/09

17-Nov - 14-Dec

## ■ Fees

order no.	description	all participants
PT-2200	subscription 2009	250.--
PT-2201	AMF 1/09	75.--
PT-2202	AMF 2/09	75.--
PT-2203	AMF 3/09	75.--
PT-2204	AMF 4/09	75.--
PT-2220	add. sample (1 x A, B)	40.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Congener Alcohols in Serum

## ■ Material

Liquid serum, 2.5 mL

## ■ Analytes

- methanol
- ethanol
- 1-propanol
- 2-propanol
- isobutanol
- 2-butanol
- 2- u. 3-methyl-1-butanol
- 1-butanol

## ■ Examinations requested

Quantitative determination of the analytes

## ■ Distributions

**BGS 1/09**

24-Mar - 20-Apr

**BGS 2/09**

15-Sep - 12-Oct

## ■ Fees

order no.	description	all participants
PT-2300	subscription 2009	225.--
PT-2301	BGS 1/09	135.--
PT-2302	BGS 2/09	135.--
PT-2320	add. sample	65.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Ethylglucuronide in Serum and Urine

## ■ Material

Lyophilized serum, 2.5 mL

Lyophilized urine, 2.5 mL

## ■ Analyte

- ethylglucuronide
- ethylsulfate

## ■ Concentration ranges

	Serum	Urine
• ethylglucuronide	0.5 – 25.0	1.0 – 100.0
• ethylsulfate	0.5 – 25.0	1.0 – 100.0

all concentrations indicated as mg/L

## ■ Examinations requested

Quantitative determination of ethylglucuronide and ethylsulfate

## ■ Distributions

ETG 1/09	ETG 2/09	ETG 3/09
17-Mar - 14-Apr	07-Jul - 03-Aug	03-Nov - 30-Nov

## ■ Fees

order no.	description	all participants
PT-2400	subscription 2009	240.--
PT-2401	ETG 1/09	95.--
PT-2402	ETG 2/09	95.--
PT-2403	ETG 3/09	95.--
PT-2420	add. samples (1 x S, U)	45.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Amanitine in Urine

## ■ Material

Lyophilized urine, 2 samples (A+B), each 1.2 mL

## ■ Analyte

Amanitines

## ■ Examinations requested

Quantitative determination of the analytes, interpretation of the results

## ■ Distributions

**ATU 1/09**

01-Sep - 21-Sep

**ATU 2/09**

03-Nov - 23-Nov

## ■ Fees

order no.	description	all participants
PT-2500	subscription 2009	140.--
PT-2501	ATU 1/09	90.--
PT-2502	ATU 2/09	90.--
PT-2520	add. samples (1 x A, B)	35.--

**All quotations indicated are net prices, plus 19% VAT, including postage and packing**

# Homocysteine in Serum

## ■ Material

Lyophilized serum or plasma, 2 samples (A+B), each 2.5 mL

## ■ Analyte

Homocysteine

## ■ Concentration ranges

homocysteine 1 - 50  $\mu\text{mol/L}$  (0.1 - 7 mg/L)

## ■ Examinations requested

Quantitative determination of homocysteine

## ■ Distributions

### HCY 1/09

10-Feb -00-Mar

### HCY 2/09

03-Jun - 22-Jun

### HCY 3/09

01-Sep - 21-Sep

### HCY 4/09

17-Nov - 07-Dec

## ■ Fees

order no.	description	all participants
PT-2600	subscription 2009	215.--
PT-2601	HCY 1/09	60.--
PT-2602	HCY 2/09	60.--
PT-2603	HCY 3/09	60.--
PT-2604	HCY 4/09	60.--
PT-2620	add. samples (1 x A+B)	30.--

All quotations indicated are net prices, plus 19% VAT, including postage and packing

# Precision criteria

The major aim of an external quality assessment scheme is to examine the comparability of the results from different laboratories for any analytes. According to Horwitz [1], who found, that the variation coefficient could be expressed as a function of the concentration according to the following equation by using data based on 150 independent surveys.

$$VC = 2 \cdot (1 - 0.5 \log C)$$

VC = variation coefficient (%)

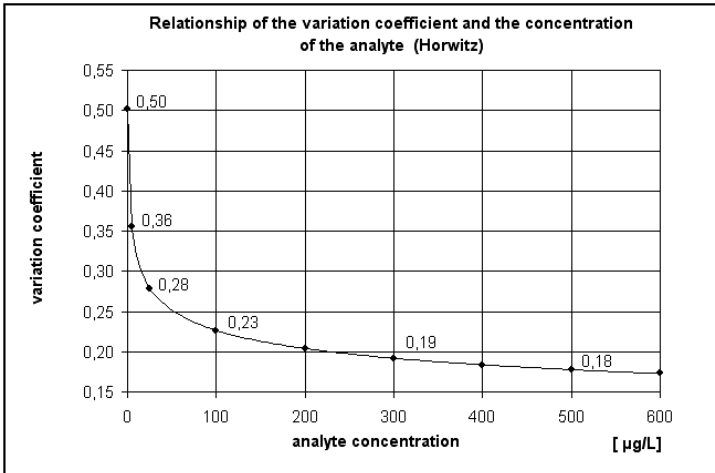
C = concentration of the analytes (kg/L !)

The surveys were implemented with different analytes, different concentration ranges and five different methods for analysis: chromatography, AAS, spectrometry, polarography, bioassay.

A consequence of the function is that the variation coefficient is halved when the concentration is increased by factor 100. The following diagram shows the summary of all accessible results of interlaboratory testing schemes up to 1982. This Horwitz function is independent of the analytes, the applied method and the conditions of the samples. The variation coefficient calculated from this function can be an indicator for the efficiency in the method regarding interlaboratory comparison.

Horwitz's equation is based on results which are already 17 years old. Since 1982 technical progress have increased the performance of the analytical methods. However the precision of any analytical method is only one aspect among others such as handling and processing of the samples. All surveys showed that Horwitz's equation can be used to assess the efficiency of analytical methods (conditions depending on the ring test).

In our quantitative ring tests we have proven that the standard deviation according to Horwitz is suitable for the evaluation of participant results.



The standard deviation between the preferred concentration range.

A further possibility of evaluating the results of interlaboratory tests is the evaluation according to the ISO 5725 [2]. The comparison standard deviation which can be calculated according to ISO 5725 depends only on the efficiency of the participants of the survey. This means in case of more strongly straying data pools the borders for the assessment of the results are extended in the comparison to the Horwitz procedure [3]. However the calculation of the evaluation borders requires multiple determination (at least two independent measured values) of the analytes according to ISO.

## Literature:

[1] HORWITZ, W (1982)

Evaluation of analytical methods used for regulation of foods and drugs.

Anal. Chem. 54 (1): 67A -76A

[2] DIN ISO 5725 (1994)

International Organization for Standardization. Genauigkeit (Richtigkeit und Präzision) von Messverfahren und Messergebnissen. ISO Central Secretariat, 1, rue de Varamba, CH 1211 Genf 20, Schweiz

[3] Herbold M, Schmitt G, Aderjan R (2003)

Auswertung forensischer Ringversuche nach ISO 5725, Beispiel: Haare - Ringversuche 2002. In: Symposium der GTFCh, Mosbach/Baden, Hrsg.: F. Pragst, R. Aderjan, Dr. Dieter Helm Verlag, Heppenheim

## Conditions of Participation

1. All laboratories working in forensic toxicology and related fields are encouraged to take part in the tests.
2. No particular methods are prescribed for the analysis.
3. Registration is possible until the start of the testing. For later registration please contact the technical management.
4. Registration is possible as single participation or subscription for all tests.
5. The results must be reported to the organizers until the deadline. In case of late mailing, the results are not included in the evaluation. The participants will receive only a summary report of the total results.
6. The results can be returned by mail, fax, email or by internet (see our homepage).
7. The evaluation of the results, according to the scientific requirements, will be updated according to the agreement of the assisting committees.
8. The participants will receive the report of their results by mail. In the case of an error in the report the participants should inform the organizer immediately. We will provide a corrected report.
9. If a survey has to be cancelled, paid registration fees will be refunded.

# Registration Form

# Proficiency Testing Scheme

Fax + 49 6227 841076 or + 49 6222 383848

of the Society of Toxicological  
and Forensic Chemistry

Lab code:  
(as available)

Member of the GTFCh: yes  no

for address data see attached form

**Delivery address**  also billing address

**Billing address**

<b>Name</b>	_____
<b>Institution</b>	_____
_____	_____
_____	_____
<b>Street</b>	_____
<b>ZIP / City</b>	_____
<b>Country</b>	_____
<b>Contact person</b>	_____
<b>Phone</b>	_____
<b>Fax</b>	_____
<b>E-Mail</b>	_____

<b>Name</b>	_____
<b>Institution</b>	_____
_____	_____
_____	_____
<b>Street</b>	_____
<b>ZIP / City</b>	_____
<b>Country</b>	_____
<b>VAT.Id.-No.<sup>1</sup></b>	_____

<sup>1</sup> necessary for all foreign participants within the EU. Without this number we have to charge VAT!

## Proficiency Testing 2009

this order is in addition to the existing continuous subscriptions

### ■ Drugs of Abuse

Illicit Drugs in Serum	BTMF
Drugs in Urine	UF
Drugs in Hair	DHF
Qualitative Screening Analysis	QSA

### subscription (all tests)

order no	2009	continuous <sup>2</sup>
PT 1100	<input type="checkbox"/>	<input type="checkbox"/>
PT 1200	<input type="checkbox"/>	<input type="checkbox"/>
PT 1300	<input type="checkbox"/>	<input type="checkbox"/>
PT 1400	<input type="checkbox"/>	<input type="checkbox"/>

### single participation

order no.	1/09	2/09	3/09	4/08
PT 110-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	
PT 120-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	
PT 130-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	
PT 140-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	

### additional samples

order no.	number per test
PT 1120	<input type="text"/> set (A,B)
PT 1220	<input type="text"/> sample/s
PT 1320	<input type="text"/> set (A,B)
PT 1420	<input type="text"/> set (S,U)

### ■ Therapeutic Drugs

Benzodiazepines in Serum	BZF
Replacement Drugs in Serum and Urine	STM
Tricyclic Antidepressant	TCA
Toxicological Analysis of Diagnostics of Brain Death	TAB
Therapeutic Drug Monitoring - Neuroleptics 1	TDMA
Therapeutic Drug Monitoring - Anticonvulsants	TDMB
Therapeutic Drug Monitoring - Neuroleptics 2	TDMC
Therapeutic Drug Monitoring - Antidepressants	TDMD

PT 1500	<input type="checkbox"/>	<input type="checkbox"/>
PT 1600	<input type="checkbox"/>	<input type="checkbox"/>
PT 1700	<input type="checkbox"/>	<input type="checkbox"/>
PT 2000	<input type="checkbox"/>	<input type="checkbox"/>
PT 1900	<input type="checkbox"/>	<input type="checkbox"/>
PT 3000	<input type="checkbox"/>	<input type="checkbox"/>
PT 3100	<input type="checkbox"/>	<input type="checkbox"/>
PT 3200	<input type="checkbox"/>	<input type="checkbox"/>

PT 150-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
PT 160-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
PT 170-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
PT 200-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
PT 190-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
PT 300-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
PT 310-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
PT 320-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

PT 1520	<input type="text"/> set (A,B)
PT 1620	<input type="text"/> set (S,U)
PT 1720	<input type="text"/> set (A,B,C,D)
PT 2020	<input type="text"/> sample/s
PT 1920	<input type="text"/> set (A,B,C,D)
PT 3020	<input type="text"/> set (A,B)
PT 3120	<input type="text"/> set (A,B)
PT 3220	<input type="text"/> set (A,B)

### ■ Alcohol

Ethanol in Serum	ETOH
Markers of Alcoholism in Serum	AMF
Congener Alcohols in Serum	BGS
Ethylglucuronide in Serum and Urine	ETG

PT 2100	<input type="checkbox"/>	<input type="checkbox"/>
PT 2200	<input type="checkbox"/>	<input type="checkbox"/>
PT 2300	<input type="checkbox"/>	<input type="checkbox"/>
PT 2400	<input type="checkbox"/>	<input type="checkbox"/>

PT 210-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
PT 220-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
PT 230-	1 <input type="checkbox"/>	2 <input type="checkbox"/>		
PT 240-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	

PT 2120	<input type="text"/> set (A,B)
PT 2220	<input type="text"/> set (A,B)
PT 2320	<input type="text"/> sample/s
PT 2420	<input type="text"/> set (S,U)

### ■ Miscellaneous

Amanitine in Urine	ATU
Homocysteine in Serum	HCY

PT 2500	<input type="checkbox"/>	<input type="checkbox"/>
PT 2600	<input type="checkbox"/>	<input type="checkbox"/>

PT 250-	1 <input type="checkbox"/>	2 <input type="checkbox"/>		
PT 260-	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

PT 2520	<input type="text"/> set (A,B)
PT 2620	<input type="text"/> set (A,B)

<sup>2</sup> The continuous subscription starts with the receipt of the registration form (also possible during the year!). If we have not receive a cancellation until 4 weeks before the start of the first test, the subscription is prolonged for one year.

Notes:
--------

Signature
-----------