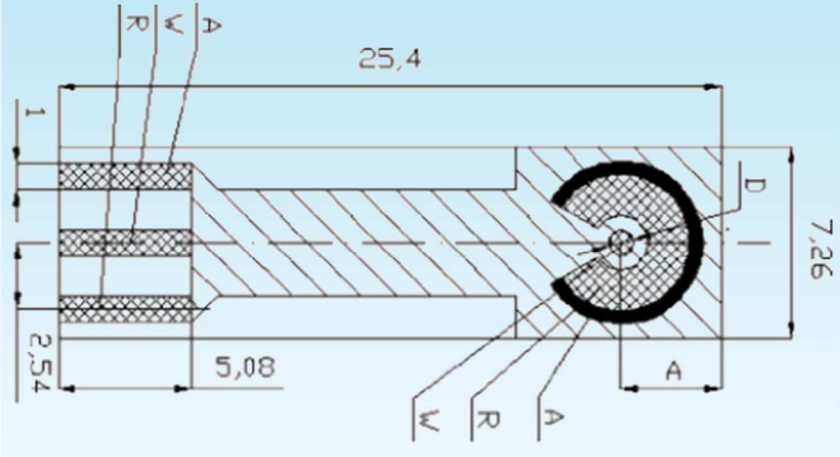
Issue 2, vol. 3/2015

BVT Technologies



AUTUMN 2015

www.bvt.cz

Dear customers,

We would like to introduce to you possibilities of training and collaboration which facilitate the application of sensors.

„Customers need to use the sensors, not to investigate them. The training saves their time."

Dr. Jan Krejci, CEO

Partners from Anhui Academy of Science & Technology, China

Utility model No. 27636 — Analytical photobioreactor

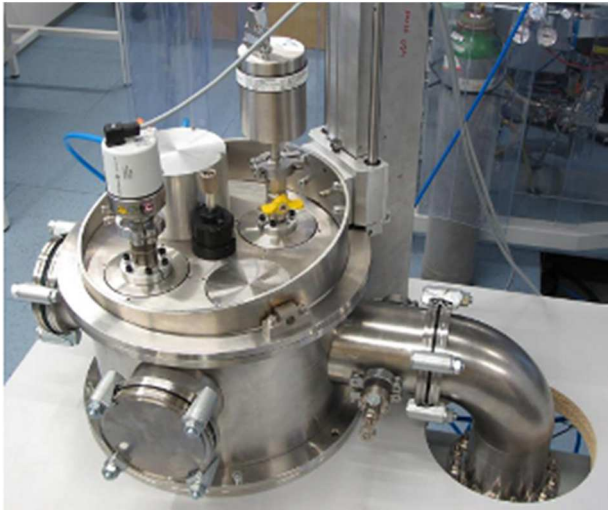
Training and collaborative testing of sensors rates

The training assures the effective introduction in the sensor technology. It can be used in different levels:

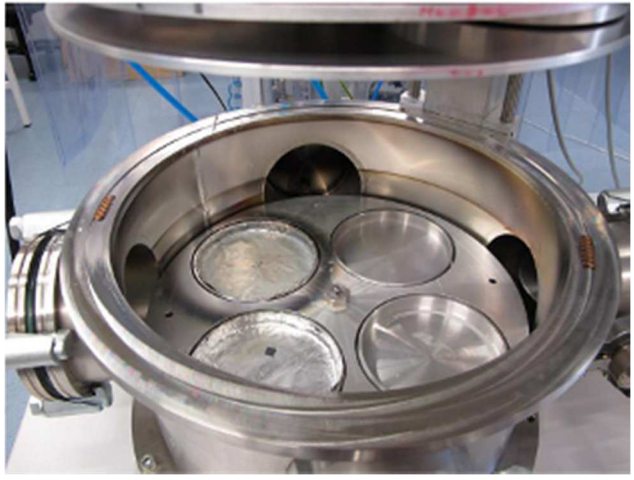
- Facility usage (rent)
- Facility usage with staff support
- Training in sensor usage application (optimization to customer application)
- Joint research or commercial project
- Support of sensor's parts of publication or of technical reports
- Organization of Summer schools, workshops, …
  (max 20 participants)

BVT´s equipment—overview

- Sputtering and chemical CVD device, BVT's own products for sensors preparation
- Characterization equipment (microscopes, flow injection analysis systems, potentiostats (PalmSens, eDAQ)
- Screen printer, furnace, measuring microscope
- Biochemical lab
- Additional mechanical facility



Device for sputtering DLC layers



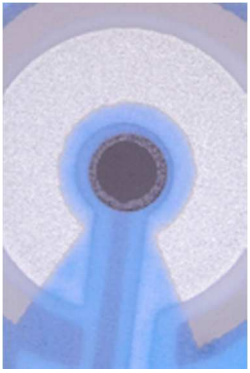
Device for sputtering DLC layers—opened

Sputtering and chemical CVD device, BVT's own products for sensors preparation

Boron doped diamond and doped diamond-like carbon are the materials of active surface of sensor with **extremely wide potential window**. It opens new horizons in electrochemical sensors use. BVT and ISI (Institute of Scientific Instruments of the ASCR, v. v. i.) have developed the device which enables sputtering and chemical vapour deposition which is optimized for sensor production and development.

(Project supported by the Ministry of Industry and Trade of the Czech Republic, program TIP, no. FR-TI1/118.)

[1, 2]



Detail of DLC sensor

Sensor with DLC layer

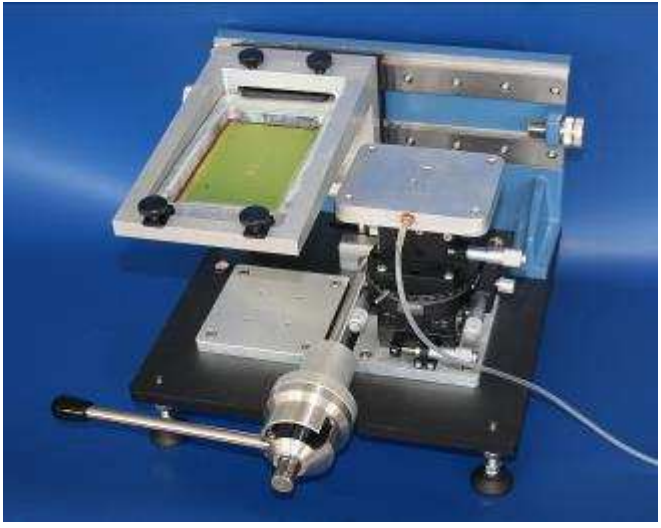
Screenprinter, furnace, measuring microscope

The laboratory of screen printing is equipped by screen printers, measuring microscopes, furnaces and additional devices which enables

- **Classic screen printing,**
- **LTCC technology (Low temperature co-fired ceramics),**
- **3D-TFT—technology enabling the printing of channels.**

Publication "**Electrochemical boron-Doped Diamond Film Microcells Micromachined with Femtosecond Laser: Application to the Determination of Water Framework Directive Metals"** is an example of combination of silicon technology with screen printing to produce diamond electrodes.

[3]



Manual screen printer

Measuring microscope

LTCC technology

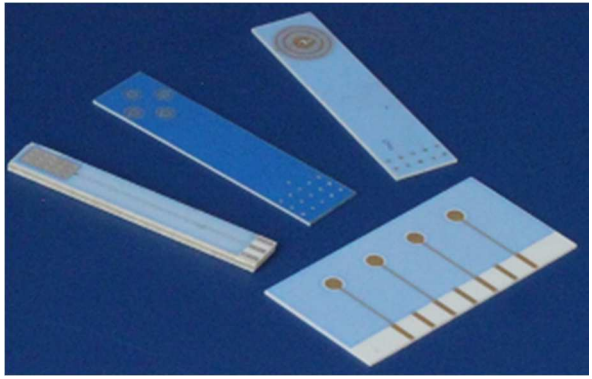
Sensor AC8

Sensor AC1 with dw = 2 mm

Special sensor

Sensor CC3

Microfilter



Variable sensors

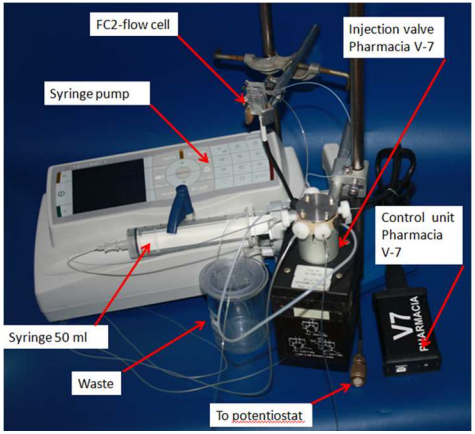
Characterization equipment (microscopes, flow injection analysis systems, potentiostats — PalmSens, eDAQ)

The laboratory is equipped with potentiostat PalmSens and eDAQ, the special, fully automated devices which enable effective measurement.”

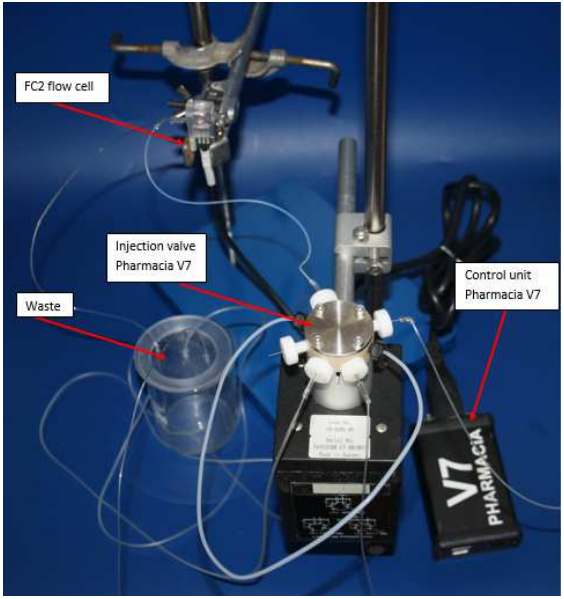
PalmSens potentiostat

EDAQ potentiostat

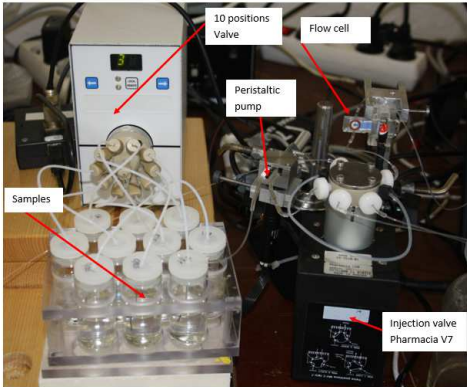
Sets for different fully automated measurement



System for automated enzyme sensor characterization



Automated system for FIA analysis



Automated characterization of multichannel sensors

Biochemical lab

Biochemical lab is used to sensor optimization and output control. The lab is equipped by chemicals and devices needed for sensor measurement optimization. More than hundreds of various electrochemical sensors are in the stock. It enables fast and effective optimization of sensor on customer demand.

[5]

[6]

[7]

Specialized customer support

The customer prepares the sensor task which he needs to solve. He prepares the chemicals and procedure design. BVT prepares the experiment from the sensor and technical side. BVT staff supports the experimental work.

The Katrlík publication is an example of such collaboration.

[4]

Joint research and commercial projects

Example of running project

BVT Technologies, a. s. works on the project „Integrated system for traffic related pollution monitoring“, TA02030179, supported by agency TA ČR, Czech Republic, focused on environmental traffic contamination.

Figures from conference Transport, health and environment 2014

The commercial projects are solved in confidentiality regimes.

Organisation of workshops and summer schools

The training activities can be connected with workshop or summer school.

Dr. Jan Krejčí presents overview of BVT Technologies,a. s.

Prof. Jiří Barek presents overview of Charles University

Dr. Nicole Jaffrezic-Renault presents overview of Claude Bernard University Lyon

Participants

Social program in Moravian Karst, Czech Republic

Training of Croatian customers

Manual Screen Printer

Office + accommodation

Office

- Desk with internet access and a printer

The simple accommodation is accessible directly in the company.

- It consists of kitchen, 2 bedrooms, bathroom
- Internet access

References

[1] **BVT 994**

A. Sbartai, P. J. F. Namour, J. Krejčí, R. Kučerová, T. Krejčí, V. Neděla, J. Sobota, N. Jaffrezic-Renault

Electrochemical performances of Diamond Like Carbon (DLC) films for lead detection in Tap Water Using Differential Pulse Anodic Stripping voltammetry (DPASV) technique

Sensor Letters , 2013; 11(8):1524-1529, DOI: 10.1166/sl.2013.2843

[2] **BVT 1338**

Jan Krejci, Zuzana Sajdlova, Vilem Nedela, Eva Flodrova, Romana Sejnohova, Hana Vranova and Robert Plicka

Effective Surface Area of Electrochemical Sensors

Journal of The Electrochemical Society, 161 (6) B147-B150 (2014), DOI: 10.1149/2.091406jes

[3] **BVT 1241**

Amel Sbartai, Philippe Namour, Abdelhamid Errachid, Jan Krejčí, Romana Šejnohová, Louis Renaud, Mohamed Larbi Hamlaoui, Anne-Sophie Loir, Florence Garrelie, Christophe Donnet, Hervé Soder. Eric Audouard, Julien Granier, and Nicole Jaffrezic-Renault

Electrochemical boron-Doped Diamond Film Microcells Micromachined with Femtosecond Laser: Application to the Determination of Water Framework Directive Metals

Anal. Chem., 2012, 84 (11), pp 4805–4811, DOI: 10.1021/ac3003598. Epub 2012 May 11.

References

[4] **BVT 1236**

A Schenkmayerová, M. Bučko, P. Gemeiner, J. Katrlík

Microbial monooxygenase amperometric biosensor for monitoring of Baeyer-Villiger biotransformation

Biosensors and Bioelectronics 50 (2013) 235-238, DOI: 10.1016/j.bios.2013.06.061

[5] **Comparison of pumps, syringes and flow stability** (poster)

I.Ventrubová[1,2], K. Lisá[1], J. Krejčí[1]

[1] BVT Technologies, a.s., Hudcova 78c, 612 00 Brno, Czech Republic, E-mail: info@bvt.cz

[2]Mendel University in Brno, Faculty of Agronomy, Brno, Czech Republic

1st Workshop of Microdialysis, Cambridge, 23.-24.9.2014

[6] **Long term stability of GOD sensor** (poster)

K. Lisá[1], I.Ventrubová[1,2], J. Krejčí[1]

[1] BVT Technologies, a.s., Hudcova 78c, 612 00 Brno, Czech Republic, E-mail: info@bvt.cz

[2]Mendel University in Brno, Faculty of Agronomy, Brno, Czech Republic

1st Workshop of Microdialysis, Cambridge, 23.-24.9.2014

References

[7] **Detection of toxic substances using biosensor** (poster)

Martina Bucková[1], Roman Ličbinský[1], Blanka Šebestová[2], Jan Krejčí[2]

[1]Division of Infrastructure and Environment, Transport Research Centre, Líšeňská 33a, 636 00 Brno, Czech Republic, [2] BVT Technologies, a.s., Strážek 206, 592 53 Strážek, Czech Republic, Email: martina.buckova@cdv.cz

SETAC, 2014

[8] **Comparison of diagnostic strips Calla and Beckman glucose analyzer – possibility of microdialysis calibration** (poster)

R. Plička [1], T. Brožová [1, 2], J. Kůdela [1, 2], I.Ventrubová[1,3], J. Krejčí [1]

[1] BVT Technologies, a.s., Hudcova 78c, 612 00 Brno, Czech Republic, E-mail: info@bvt.cz

[2]Brno University of technology, Faculty of Mechanical, Brno,Czech Republic

[3]Mendel University in Brno, Faculty of Agronomy, Brno, Czech Republic

1st Workshop of Microdialysis, Cambridge, 23.-24.9.2014

[9] **Products usable for microdialysis** (poster)

L. Ježová [1], L. Klusáková [1], I.Ventrubová[1,2], R. Plička[1], B. Šebestová,[1] J. Krejčí [1]

[1] BVT Technologies, a.s., Hudcova 78c, 612 00 Brno, Czech Republic, E-mail: info@bvt.cz

[2]Mendel University in Brno, Faculty of Agronomy, Brno, Czech Republic

1st Workshop of Microdialysis, Cambridge, 23.-24.9.2014

References

[10] **Efficiency Wall-Jet Cell FC2**

I.Ventrubová[1,2], J. Krejčí [1] , L. Ježová [1]

[1] BVT Technologies, a.s., Hudcova 78c, 612 00 Brno, Czech Republic, E-mail: info@bvt.cz

[2]Mendel University in Brno, Faculty of Agronomy, Brno, Czech Republic

Collection of Conference Proceedings International Conference Modern Electrochemical Methods XXXIV, 2014,)) 80 - 84 ISBN: 978-80-905221-2-1

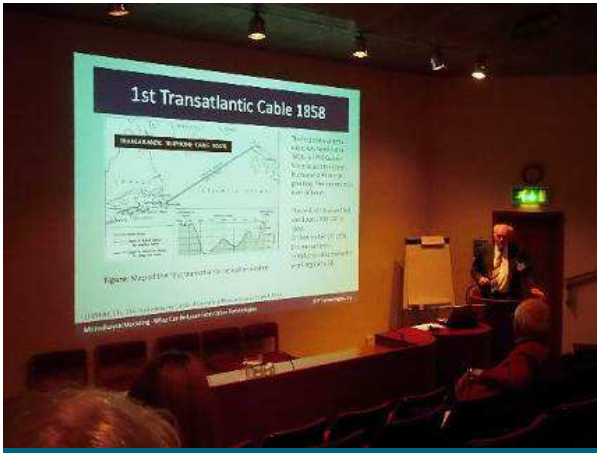
[11] **Glucose concentrations in blood and tissue - variable time lag**

R. Chlup[1,2], J. Krejci[3], M. O´Connell[4], B. Sebestova[3], R. Plicka[3], L. Jezova[3], T. Brozova[3,5], B. Doubravova[3], H. Zalesakova[2], J. Vojtek[3], J. Bartek[5]

[1]Dept. of Physiology and IInd Dept. of Medicine, Palacký University and Teaching Hospital, Olomouc, [2]Institute of Gerontology and Geriatrics, Moravsky Beroun, [3]BVT Technologies, a.s., Strazek, Czech Republic, [4]Probe Scientific Ltd, Bedford, UK, [5]Dept. of Medical Chemistry and Biochemistry, Palacký University Olomouc, Olomouc, Czech Republic, , [5]Brno University of Technology, Faculty of Mechanical engineering, Brno, Czech Republic

50th Congress of the European Association for the Study of Diabetes, Vienna, Austria, September 15th.. – 19th 2014

In Würzburg with our China representative Dr. Jianbo Xiao



Dr. Krejčí presented on Microdialysis workshop, Cambridge

In Würzburg, Germany

At Robinson College after Microdialysis workshop, Cambridge, UK

Active participation in Microdialysis workshop, Cambridge, UK, 22.-24.9.2014

[5, 6, 8, 9, 10, 11]

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