EMPA – MATERIALS AND TECHNOLOGIES FOR A SUSTAINABLE FUTURE

As an interdisciplinary research institute of the ETH Domain, Empa, the Swiss Federal Laboratories for Materials Science and Technology, conducts cutting-edge materials and technology research. Empa's R&D activities focus on meeting the requirements of industry and the needs of society, and thus link applications-oriented research to the practical implementation of new ideas. As a result, Empa is capable of providing its partners with customized solutions that not only enhance their innovative edge and competitiveness, but also help to improve the quality of life for the public at large, true to its mission statement: "Empa – The Place where Innovation Starts". As part of the ETH Domain, Empa is committed to excellence in all its activities.

GENERAL INFORMATION

The conference will be free of charge.
Please refer to the Empa VERT Forum to obtain reduced accommodation rates in certain local hotels.

Registration
By e-mail via VERT Association: **ttm.a.mayer@bluewin.ch**

Further information
VERT Association
Dr. Andreas Mayer
Fohrhölzlistrasse 14b
5443 Niederrohrdorf/Switzerland
Phone: +41 56 496 64 14
E-mail: ttm.a.mayer@bluewin.ch

Contact Empa
Empa, Laboratory for Advanced Analytical Technologies
Dr. Norbert Heeb
Überlandstrasse 129
8600 Dübendorf/Switzerland
Phone: +41 58 765 42 57
E-mail: norbert.heeb@empa.ch
www.empa-akademie.ch/vertfocusevent

FOCUS EVENT

Effect- and toxicity-based assessment of exhausts

Advanced and reliable hazard assessment tools for the implementation of new technology

Empa, Dübendorf, Überlandstrasse 129
Friday, March 16, 2018, from 9:00 to 17:00

Registration by e-mail: *ttm.a.mayer@bluewin.ch*

TOPIC

This year's focus event will look back on about 10 years of effect- and toxicity-based assessment of vehicle exhausts and demonstrate the potential of physical, chemical and cell-based methods to assess hazards.

MOTIVATION

Vehicle technology changes quickly and new engine designs, new converter technologies and alternative fuels enter the market faster than their hazards can be assessed.

There is no doubt that these new technologies will change the chemical composition and toxicity of exhausts and hence alter the impact on men and environment.

"Diesel-gate" has hampered the reputation of diesel vehicles and has become an economical problem also for related industry. It also showed that tighter control and inspection is needed.

Current legislation and consequently engine and vehicle development relays on control of few pollutants only. Regulated are CO, NO_x, THC, PM, PN and CO_2. From a toxicologist's perspective, this is not specific enough. Individual toxic compounds and combinatory effects are relevant too. Therefore alternative ways are needed to assess the toxicity of exhausts.

We will demonstrate the potential of (i) chemical analysis of target compounds to predict hazards, (ii) the use of cell receptor models to report activity, and (iii) the applicability of cultured lung cells to study effects like oxidative stress, pro-inflammatory response, and genotoxicity, to learn more on hazards of complete exhausts.

PARTICIPANTS

Cordially invited are representatives of industry, government, academia, current and future members of the VERT association, and those curious to learn more on new methods for hazard assessment of combustion exhausts.

PROGRAM

9:00 Welcome address
D. Bleiner, Empa

KEY ADDRESSES

9:05 The human lung and its susceptibility against combustion-generated and manmade nanoparticles.
P. Gehr, University of Bern

9:30 Exhaust assessment beyond the legal framework
A. Mayer, TTM

ASSESSMENT OF NANOPARTICLE PROPERTIES

9:55 Relevant nanoparticle properties and how to measure them and expose them to cells
H. Burtscher, UASNWS

10:20 Nanoparticle emissions of combustion engines
J. Czerwinski, UASB

10:45 Coffee break

11:10 Nanoparticle – biobarrier interactions: Impact of particle properties on barrier penetration and functionality
T. Bürki, Empa

CHEMICAL ASSESSMENT OF EXHAUSTS

11:35 Chemistry-based assessment of combustion exhausts
N. Heeb, Empa

12:00 Comparison of genotoxic potentials of diesel and gasoline vehicles
M. Muñoz, Empa

12:25 Lunch and coffee

CELL-BASED ASSAYS WITH SPECIFIC RECEPTORS

13:15 ELISA in exhaust characterization, Experiences from Arylhydrocarbon-Receptor-Callux measurements
H.P. Nägeli, University of Zürich

13:40 Modern mutagenicity tests, Ames revisited
R. Schins, IUF

ALTERNATIVE CELL-BASED METHODS TO ASSESS HAZARDS OF EXHAUSTS

14:05 Human lung cell co-cultures – state of the art
B. Rothen-Rutishauser, AMI

14:30 Lung cell responses upon diesel and GDI vehicle exposures
C. Bisig, AMI

14:55 Impact of vehicle exhaust exposure on respiratory epithelial and natural killer cells
L. Müller, UKBB

15:20 Coffee break

15:45 Health effects of combustion and ambient aerosols on normal and diseased airway epithelia
M. Geiser, University Bern

POSSIBILITIES FOR A TOXICITY-BASED LEGISLATION

16:10 Options for effect- and toxicology-based legislation, the precautionary principle
C. Studer, BAG

16:35 Evolution of EU legislation towards an effect- and toxicology-based legislation
NN, EU

17:00 Closing Remarks
N. Heeb, Empa