

Press Release

New VITROCELL® cigarette smoking machine for puff by puff analysis opens up advanced possibilities for research

The smoking machine VITROCELL® VC10® CHEMCONTROL is specially developed for chemical and biological analysis of individual puffs. The effects of whole smoke as well as the gas phase for each individual puff can be analysed using a special smoking regime and unique sampling unit.

Special machine configuration for VC10® CHEMCONTROL

The test sequence is as follows: the cigarettes are loaded and lightened automatically. The individual first and subsequent 7 puffs are guided each to a total of 8 individual sampling points. Here impingers or other analysis tools may be placed.

The unique valve and purging system allows for the following regime:

- Each first puff of the cigarettes is directed to sampling point # 1.
After that there is the choice to purge the system. For this purpose the valve towards the cigarette holders is closed and the valve towards the purging gas (e. g. Synthetic Air) is opened. The pump is performing a defined number of purging puffs.

Thereafter the valve for the purging gas is closed and the valve towards the smoke ports opened.

- Each 2. puff of the cigarettes is directed to sampling point # 2.
Then purging takes place in the same way than above.
- Each 3. puff of the cigarettes is directed to sampling point # 3.
Then purging takes place in the same way than above.
- Same procedure for puff 4 until final puff 8 (or a fraction of final puff) which is directed to sampling point # 8.
Then purging takes place in the same way than above.

Generation of smoke with the shortest distance to the analytical instrument

The success of an experiment with mainstream tobacco smoke it is important that the distance between the smoke generation (cigarette holders) and the analytical instrument is as short as possible in order to avoid aging and to guarantee a smoke composition matching the real-life situation. This was realised with the creation of the special sampling unit.

Freely programmable parameters

The computer system of the smoking robot allows highly flexible programming of the smoking process. Changing from single cigarette smoke to serial smoke mode for a defined number of cigarettes is possible. All parameters of the smoking process can be defined according to the needs of the experiment:

- > puff and exhaust duration
- > puff frequency
- > puff volume
- > puff profile
- > ventilation flow rate
- > butt length sensor
- > single smoke (1 cigarette) or
- > various special serial smoke (1-10 cigarettes) modes

Open and flexible system / integration of other analytical tools

The robot is designed to allow easy access to all tubes, filters and the pumping system. The feature is very important when working with whole smoke. The mainstream smoke requires easy access to all components for cleaning purposes. Additional analytical equipment relevant to the experiment can be installed without difficulty.

Meets requirements of ISO 3308 as well as Health Canada Intense Smoking Conditions

Both the requirements of ISO 3308 as well as Health Canada Intense Smoking Conditions are met due to a new interchange module which can be installed in less than 15 minutes. For the ISO test a 50 ml cylinder can be used for the suction of 35 ml, whereas for Health Canada requirements a 100 ml cylinder is used to achieve the volume of 55 ml per puff. So there is a choice of the optimal cylinder size for each puff volume.

About VITROCELL® SYSTEMS

VITROCELL® SYSTEMS offers a large product program of equipment for the in vitro analysis of airborne substances such as gases, nano particles and complex mixtures. The VITROCELL® product range helps to reduce animal testing in the field of e. g. inhalation toxicology. For this purpose human cells or bacteria are cultivated in special exposure modules and then exposed to the test substances. The customers of VITROCELL® are leading medical and environmental research institutes as well as the pharmaceutical and other industries.

More information: www.vitrocell.com

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