

New Method for Pulse-Free Microdosing

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Acuros GmbH has developed a new technology for the creation for pulsation-free microflows. The process is based on the principle of osmosis, which is well-known from nature, and is ideal for the precise regulation of even the smallest volume fluxes.

In cooperation with Humboldt-University Berlin, Acuros, a technology company in the microfluidics sector, has developed a new procedure which makes it possible to deliver even the smallest liquid flows ranging from a few nanolitres per minute, absolutely pulsation-free. The new micropumps work with an osmotic actuation, that does not contain any movable parts. Due to this, no oscillations in the volume flow occur which are caused by mechanical drives of conventional micropumps.

In fluidic microtechnology the creation of highly precise microflows constitutes a special challenge – be it the dosing of reagents in chemical technology, the transport of liquid media in micro and nano analytics, "Lab-on-a-Chip", or in other microfluidical applications. There, the precision and the persistence have immediate effects on the quality of both the product or the analysis. Due to frictional effects, small irregularities in mechanics, and the limited increments of step motors, all electromechanical micropumps show a pulsation in the liquid stream whose negative effects increase with lower flow rates.

Acuros' osmotic micropumps do not contain any mechanics nor any movable parts. Due to an osmotic potential between the two sides of a special membrane, a working liquid is delivered, exerting pressure on a reservoir which contains the liquid that is to be pumped. In the pump, this application liquid is tempered, and is pumped absolutely pulse-free out of the reservoir. Acuros' innovation makes it possible to precisely regulate the osmotic process, and thus to deliver continuous microflows during very large periods without interruptions. Application pressures of several bars can be achieved. Typical flowrates range between a few nanolitres and several microlitres per minute.

Acuros presents the new generation of precision micropumps at the ACHEMA fair which takes place in Frankfurt from 11th to 15th May 2009.

For further information please
contact:

Helge Adleff
Acuros GmbH
Rudower Chaussee 29
12489 Berlin, Germany
Tel.: 030 41721590
Email: h.adleff@acuros.de

