

Simultaneous mobile nutrient recovery and mobile sludge dewatering on sewage treatment plants. Part II

Autonomous microflame-ionization-detector to provide danger of explosion in urban sewer systems (FIDEX)

Motivation:

Little is known that in sewer systems a potential of danger exists for explosions. In these subterranean systems explosive material mixtures can originate, for example, from running out petrol or from inlets of cleaning agents from households. Already small quantities of these materials can evaporate and generate an atmosphere capable of explosion. But even in normal use a dangerous aggregation from explosive substances can't be excluded due to long retention times of the sewage. Therefore an early reliable detection is important, to recognise dangerous materials and to take measures in time.

Goals and workpackages:

The aim of the project FIDEX is to recognise dangerous situations in the canalisation faster and more actually. For this reason an innovative detectionssystem which supervises the sewer system is going to be developed. Core of the detectionssystem is an autonomous micro-flame-ionization-detector (FID). There will be no need of external supply with highly pure hydrogen for building the flame to measure. The hydrogen is generated directly in the system. Thereby the FID can easily be used even in hardly accessible sewer systems.

Innovations and perspectives:

The autonomous FID will provide more security in urban sewer systems. The high economic efficiency, sensitivity and selectivity of the sensor system also offers a large potential for utilization in other areas, like, explosion protection in bio-gas gas plants. Besides, further miniaturization of the technology may allow an application as portable warning device for rescue service in the emergency help

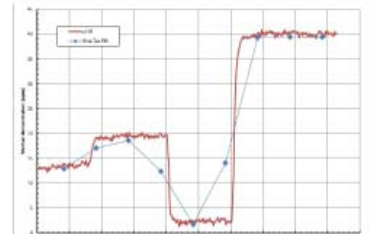


Figure.: Comparison of measured values of the μ FID with a commercial device

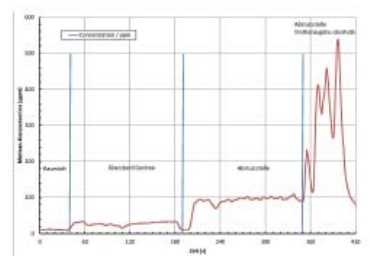


Figure.: Inlet measurements at the WWTP

Financing Institution:
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Duration:
11/2014 - 10/2017



Figure: Measuring cylinder for comparison measurement with dry and humid sample gas