

The aim of 3iTOX is the development of: a Biological and Chemical sensorplatform for monitoring water quality within low detection bounds (limits).

By monitoring the quality of surface water during previous years a decision has been made to use more frequently biomonitors based on toxicity. Biomonitors then function as an early warning system for water companies, so they can stop the intake of surface water once the measurement made by the biomonitor has given reason to do so. Because of the potentially large number of substances in surface water, biological and chemical monitors are less suitable as early warning system. Also monitors used for measuring drinking-water based on identification of biological or chemical characteristics, (among other things optical-chemical sensors) are not applicable for monitoring the quality of surface water, because these monitors require a relatively clean sample.

Dutch and foreign water companies need more sensitive early warning systems. Moreover at a sign of toxicity they want to have as quickly as possible information concerning the nature of pollution.

Developing technology

The cooperating companies want to create a breakthrough in the international market for early warning systems by developing 3iTOX.

3iTOX is a biological and chemical sensorplatform for monitoring the quality of water with low detection bounds(limits). It will be a robust system with a highly sensitive measuring technology for toxicity, organic and microbiological pollutions and heavy metals combined with computerized concentration methods based on Solid Phase Extraction.

The cooperating companies wish to develop the following technology and the components required:

1. A platform for monitoring the toxic impact in the microgram range (1-10 ppb), detection of heavy metal in the low microgram range (1-10 ppb) and detection of microbiological pollution with a detection limit of 0.5 ng/liter.
2. A sensitive laboratory technology for measuring ATP with a detection range of 0.5 ng/liter.
3. A reliable and sensitive technique for on-line observing microbiological pollution by means of detection ATP.
4. A reliable and sensitive technique for measuring heavy metalions in water based on capillair electroforesis.
5. On-line SPE system for concentrating (factor 500-1000) organic contaminants respectively heavy metal.

6. Techniques for the interpretation of the different indicators of the platform for monitoring the toxic impact in the microgramrange (1-10 ppb), detection of heavy metal in the low microgram range (1-10 ppb) and detection of microbiological pollution with a detection limit of 0.5 ng/liter.

Participants and cooperation

The project 3iTOX is implemented by a consortium consisting of the following companies:

1. microLAN BV: www.microlan.nl / www.toxcontrol.com
2. KWR Water BV (Water Research Institute, formerly known as KIWA))
3. Capilix BV (developer of microchip Capillary Electrophoresis systems)
4. Stichting Water Laboratorium Noord (Corporation Waterlaboratory North)
5. Aqua Explorer BV (developer of ATP technique)
6. Vitens (Water Company)
7. Stichting Waternet (Corporation Waternet; Water company for Amsterdam)