Getting wastewater ready for your glass

A new osmotic process efficiently removes waste and salt from water.

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http://dx.doi.org/10.5772/intechopen.72289

Wastewater can be turned into drinking water easily and effectively.

It has been said that the next world war will be over drinking water. Globally, water scarcity is intensified by factors such as climate change and contamination.

There is a serious need to find alternative water sources or to improve the performance of current water and wastewater treatment plants. Wastewater can serve as an alternative drinking water source. It is abundantly available, and its composition is known. However, there is resistance towards wastewater reuse, because drinking water is often judged based on its source, rather than its quality.

Researchers at UNISA, together with colleagues from Ghent University in Belgium, have developed an energy-efficient treatment system to purify seawater and wastewater effluent, lifting it to drinking water status. This was achieved through the use of an integrated osmotic- and pressure-driven membrane filtration system.

"The osmotic membrane process involves the cleaning of dirty water using a semipermeable membrane filter that allows only water to pass through, leaving the dirt and toxic substances trapped on the filter surface," says Dr Mxolisi Motsa. "The movement of pure water is induced by the difference in salt concentrations between wastewater and seawater. The system has been tested at laboratory scale, treating a total of one hundred litres a day."

This process promises to offer simple and effective alternatives to treating nontraditional water sources such as wastewater effluent and seawater.

"Government, industry and researchers need to collaborate to accelerate the development, testing and eventual commercialisation of these technologies for the benefit of society."