Finnish researchers develop quick test kit for detecting phenolic compounds in drinking water

August 22 2013

The test turns red to indicate that the sample contains phenol.

Clean drinking water is a diminishing natural resource in developing nations and in many industrialised countries. VTT Technical Research

Centre of Finland has developed a simple and inexpensive test kit that detects phenolic compounds in water. Sources of phenolic compounds found in drinking water include industrial wastewaters, drug residues and pipes. Certain phenolic compounds are toxic and some may even cause cancer.

The method developed by VTT is based on a chemical reaction. A small test stick determines whether or not a water sample contains harmful phenolic compounds. If so, the stick will change colour within a few minutes. No quick, easy and inexpensive water quality test has been available until now. VTT's test will be launched in 2 to 3 years.

High levels of phenolic compounds in water are a problem particularly in industrialised countries, where an inexpensive test kit has market potential not only in the industrial and agricultural sectors but in use by health inspectors, water utilities, and possibly even consumers.

Markets for water quality test kits are also increasing in the developing countries. Dwindling water resources, increasing water prices, inadequate sewer systems and long distances between sample sites and laboratories increase the demand for simple and inexpensive test methods which can be applied on site.

Non-degradable, toxic and ecologically unsafe, phenolic compounds in industrial wastewaters are among the most harmful. Chlorophenols, for example, are carcinogenic and affect hepatic and renal function. In industrial wastewaters, the concentration of phenolic compounds may be as high as several hundreds of milligrams per litre. The cut-off value in VTT's test is currently 0.1 mg/l, but development of test precision continues.

Phenolic compounds are used as raw material in chemical industries for producing polymers, phenolic resins, explosives, pigments and drugs.

Phenols can be found in the wastewaters of oil refineries and petrochemical, wood processing, plastics, rubber, textile, coating and leather industries.

VTT and the University of Helsinki have developed water quality test kits in collaboration with their industrial partners.

Provided by VTT Technical Research Centre of Finland