Better detection of mercury contamination

Mercury contamination has a negative impact on both the environment and human health. Researchers have developed a simple visual technique that will make detecting mercury pollution much easier.

Mercury poses an international threat, as it can be transported through the air and through the food chain, especially via fish. It is mainly used in thermometers, barometers, dental fillings and batteries. It is also used by industry in chlorine production. Exposure to mercury can damage the nervous and reproductive systems and cause serious effects such as brain damage and chronic disease. Pregnant women and children are particularly vulnerable.

The new technique for detecting mercury contamination uses micro- and nano-scale technologies. The researchers created a nano-scale gold stick that changes colour when it comes into contact with solutions containing mercury (II) ions. These ions are the most stable form of inorganic mercury and are known to accumulate in the food chain.

The device rapidly changes colour from red to purple when it detects mercury, with higher levels of mercury leading to a stronger colour change. Other methods currently available to detect mercury usually require lab-based instruments. However, demand is growing for techniques that allow rapid mercury detection in drinking water, food and soil at contaminated sites.

The device’s advantages are that it is simple, inexpensive, works at room temperature and can be used for on-site detection. For these reasons, it is particularly beneficial for use in developing countries. The device will benefit from further improvements to increase sensitivity to the lowest mercury concentrations. In addition to detecting mercury in the environment, the device may also have clinical and security applications.

Current global supply of mercury is around 3,600 tonnes per year. The EU is a major exporter, exporting around 1,000 tonnes in 2005. However, the EU intends to address global mercury pollution through a comprehensive strategy which will phase out mercury exports by 2011.


Contact: spsong@sinap.ac.cn and fchh@sinap.ac.cn

Themes: Chemicals, Environment and health, Environmental technologies