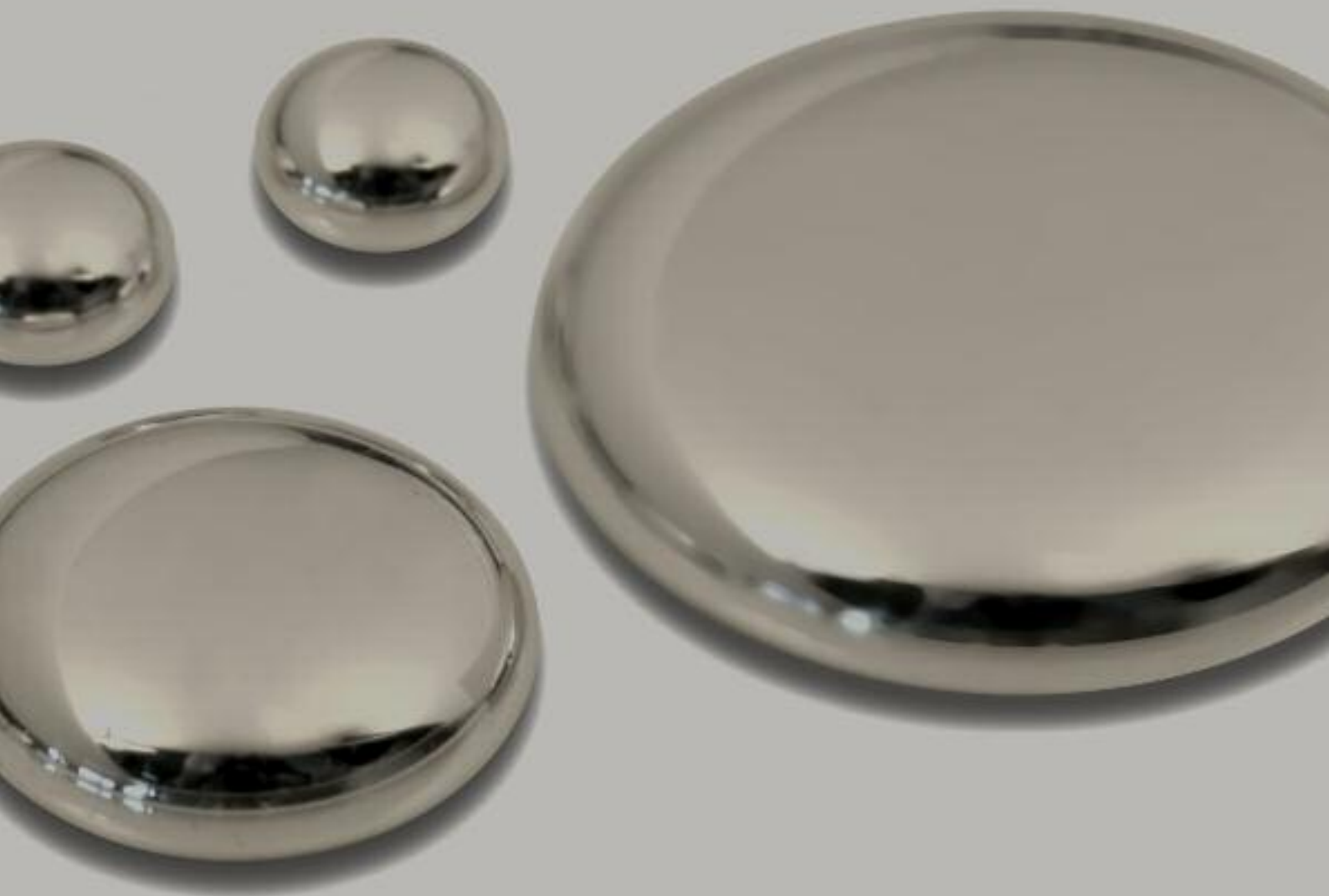


CHEMICAL SAFETY





WHAT IS MERCURY?

Mercury occurs naturally in the environment and can also be released into the air through industrial pollution. Mercury falls from the air and accumulates in streams and oceans where it turns into a more harmful version called methylmercury. Fish absorb the methylmercury and it builds up in their tissue. Bigger fish feed on smaller fish, resulting in the levels of mercury accumulating mainly in the fatty tissue of those higher up in the food chain.

Source: <http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/Seafood/FoodbornePathogens-Contaminants/Methylmercury/ucm115662.htm>

MERCURY POISONING COULD RESULT FROM DAILY INTAKE OF SOME LOCAL FISH, CSIR STUDY FINDS

Appeals for ongoing fish sampling and data collection

SUBSISTENCE FISHERMEN along the South African coastline should be warned to limit their intake of locally caught fish due to the potential of mercury poisoning. Mercury monitoring in coastal waters should also be continued and extended to include a comprehensive list of marine fish species.

A recent CSIR study found that mercury concentrations in Red Roman, Red Panga and Silver Fish caught along the South African coast line exceeded the World Health Organization's guideline value of 0.2 $\mu\text{g/g}$ for sensitive subpopulation groups.

Concentrations ranged from 0.014 $\mu\text{g/g}$ for Mullet to 0.486 $\mu\text{g/g}$ for Red Roman and showed great variability across loca-

tions and fish species. The highest mercury concentrations recorded during the study occurred in False Bay, followed by the West Coast, Durban, Kalk Bay and Yzerfontein.

The study was initiated by the former South African Mercury Assessment Programme (SAMA) and focused on assessing the potential health risk from consuming locally caught fish off the South African coastline. This initiative was broadened in 2008 to include a focus on a broader scope of heavy metals within a CSIR trace metals research programme.

As part of an international collaboration agreement, researchers from the University of Connecticut in the US visited South African shores to train CSIR researchers to conduct the mercury sampling. As part of



Mamopeli Matookane

this initiative, CSIR researcher Chavon Williams visited the US for six weeks where she received training in the analysis of fish samples for mercury contamination, using the Direct Mercury Analyser and Cold Vapour Atomic Fluorescence Spectrometer. Today she is skilled in doing the same analysis in the CSIR's own state-of-the-art mercury testing lab in Stellenbosch.

According to CSIR researcher Mamopeli Matookane, the preliminary results suggest that subsistence fishermen and especially sensitive subpopulation groups such as pregnant women and children are potentially at risk from consuming local fish.

"In the short term these risks should be communicated to these communities. In the long term, ongoing fish sampling and additional data collection should take place," she argues in a paper presented at the annual conference of the International Society for Exposure Science held in the US this year.

Matookane also suggests further research to include biomonitoring in the target population in order to improve exposure and risk estimates. Currently South Africa has no fish consumption guidelines based on health risk, particularly for population groups with high consumption rates such as subsistence fisher-

men. The results from this study highlight the importance of addressing this critical knowledge gap in order to safeguard the health of consumers. – Wiida Basson

HOW SAFE IS OUR FISH?

While mercury-contaminated fish is not a uniquely South African problem, we lack specific guidelines or information about the levels of mercury contamination in the country. In the United States, the Environmental Protection Agency and the US Food and Drug Administration warn people that nearly all fish and shellfish contain traces of methylmercury – therefore one should control one's intake and vulnerable groups like young children and pregnant women should be very careful. The best advice would be for consumers to be aware of these risks and to obtain information from advisory groups if they have questions. However, consumers should know that eating fish containing chemical pollutants may cause birth defects, liver damage, cancer and other serious health problems.

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Small-scale gold miners vulnerable to dangers of mercury poisoning

ABOUT 20 000 SMALL-SCALE GOLD MINERS in South Africa could be unwittingly exposing themselves and the surrounding environment to mercury poisoning due to their operations.

According to a CSIR study in a rural community close to a river and gold-mining operations in Mpumalanga, nearly half of the people tested had urine and blood mercury levels that may cause symptoms such as fever, insomnia, mood swings and tremors.

Small-scale gold miners, mostly illegal, are at risk of inhaling mercury vapours when the gold/mercury amalgam is heated, often in open containers, when they attempt to extract the gold.

According to CSIR senior researcher Riëtha Oosthuizen, the inhalation of mercury vapours is a significant threat to human health: "Although the miners handle mercury directly, it can also affect the environment. Exposure of people living in close proximity to mine sites is primarily via mercury vapours from amalgam-burning or gold-melting, or via consumption of contaminated water or fish." However, samples of the water and edible fish from the specific river showed normal levels.

"If exposure is via inhalation of mercury vapour, about 80% of the mercury may enter the bloodstream and is distributed to other organs, including the brain, where it affects the central nervous system. These effects may be irreversible. Metallic mercury may also cross the placenta of pregnant women," she explains.

The study was complicated by the fact that most of these mining operations are taking place illegally, without mining permits or the permission of the owners. In addition the miners are mostly illiterate and therefore generally unaware of the danger associated with the use of mercury in the amalgamation process.

After completion of the survey those individuals with elevated mercury levels in their urine and blood were referred to a local occupational outpatient clinic specialising in mercury poisoning. - Wiida Basson

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