

New method for tracing metal pollution back to its sources

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Air quality tested in Sao Paulo, Brazil.

A new way of pinpointing where zinc pollution in the atmosphere comes from could improve pollution monitoring and regulation, says research out this week in the journal *Analytical Chemistry*.

Imperial College London researchers say their work is a major breakthrough as current methods for analysing zinc pollution only measure pollution in the atmosphere; they do not trace it back to its source.

Researchers say their method will provide a new tool for policy makers and modellers. A better understanding of zinc pollution sources could inform and improve national and international pollution strategies.

At low levels, zinc is an essential mineral used by plants and animals.

But at higher levels, zinc pollution is suspected of causing cardiovascular, reproductive, immune, and respiratory problems.

Researchers trialled their method on atmospheric samples collected in Sao Paulo, Brazil. They worked in conjunction with researchers from the University of Sao Paulo who wanted to find out where zinc pollution comes from.

The analysis of air samples suggested that a major source of zinc in the city's atmosphere comes from cars and not from manufacturers as previously thought.

Scientists traced zinc pollution to car exhaust fumes and metal friction when cars brake, releasing zinc into the atmosphere. The study's co-author, Dr Dominik Weiss, from Imperial's Department of Earth Science and Engineering, says:

"We need to know where these sources of pollution are coming from because exposure to zinc pollution over a long period of time is a significant concern for the health of residents in big cities such as Sao Paulo or London."

The new method analyses zinc isotopes, which vary according to the pollution source. For instance, zinc isotopes in car exhaust are different from zinc isotopes coming out of industrial smoke stacks. The identity of these isotopes provides the clues to trace zinc pollution back to its source.

Dr Weiss says this technique for analysing isotopes could also be applied to tracing the sources of other metals such as cadmium, copper and thallium. He adds:

"Trace metals have a nasty way of bio-accumulating. They build up through the food chain with toxic consequences. Our new method could help policy makers find some more accurate answers about the true sources of metal pollution."

Citation: "Accurate and precise zinc isotope ratio measurements in urban aerosols", Analytical Chemistry, Tuesday 18 November 2008 (Print publication) Link to paper: [pubs.acs.org/acs/journals/toc. ...
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Source: Imperial College London

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