

## Warnings issued over nanoparticle health risks

Specialists warn that ultrafine particles may penetrate the respiratory and cardiovascular systems.

Grupo Reforma / By Alejandro Ramos and Ivan Sosa



Federal authorities look to produce fuel with lower levels of sulfur.  
Photo: Julio Argumedo

**Mexico City** (April 23, 2006).-With a size equivalent to one-thousandth of a millimeter (PM.1), nanoparticles are pollutants that are inhaled daily by the inhabitants of the Mexico City Metropolitan Area.

The first observations from the **MILAGRO** campaign (Megacity Initiative: Local and Global Research Observations) carried out this past March 2-30, report the presence of chemicals that represent high risk to the health of the population.

"It is serious; a very important finding that we must direct our attention to", stated Mario Molina, Nobel Prize in Chemistry.

"It is an indication for scientists to conduct more studies on health hazards brought on by pollution and for the authorities to apply any measures necessary to control it", commented Molina.

For the president of the National Institute of Ecology (INE), Adrian Fernandez, "ultrafine particles are the most hazardous because they penetrate and lodge themselves in the deepest part of the respiratory system also accessing the cardiovascular system".

"They are generated by vehicular combustion processes, particularly of buses with diesel engines".

To date, the measurement of nanoparticles can only be conducted with scientific equipment, according to Sergio Sanchez, director of the World Bank's Clean Air Initiative.

"There still aren't any commercial instruments on the market available to measure these types of pollutants in a consistent manner. For the moment, only specialists like the ones participating in the **MILAGRO** campaign own prototype equipment to determine the dimensions of what these findings entail", revealed Sanchez.

Jose Luis Luege, Secretary of the Environment and Natural Resources, suggested that nanoparticles are triggering changes in the government's criteria in order to protect the health of the population.

We aren't in a position to choose between breathing ozone or nanoparticles. Therefore, we must change our measurement criteria as well as the pollution levels considered critical in order to declare a state of atmospheric emergency", indicated Luege.

The coordinator of the **MILAGRO** Campaign, Luisa Molina, explained that in the past only the total suspended particles (PST) were measured. After that began the measurement of particles smaller than 10 micrometers (PM10) and then PM2.5.

"With the **MILAGRO** Campaign we have been able to prove that the nanoparticles are a product of vehicle combustion, not only of diesel, but also of gasoline.

"A study conducted in 2003 in the Mexico City Metropolitan Area showed that the concentrations of PM2. (which are hazardous because they penetrate the lungs and the circulatory system) decreased during vacation periods. This confirmed that the emission sources come from cars and traffic", explained Luisa Molina.

The Secretary of the Environment of Mexico City, Claudia Sheinbaum, recognized that fine and ultrafine particles constitute a new challenge in the quest to improve the quality of the air breathed by 18 million inhabitants.

## **Pollution Exodus**

### **The world 'shares' pollutant emissions**

#### **1980**

Monitoring begins of total suspended particles (PST) within the city. Particles equal to the width of a human hair.

#### **1995**

Automatic measurement of particles smaller than 10 micrometers (PM10). 5 PM10; equal to the diameter of a human hair.

#### **2003**

Examination of particles less than 2.5 micrometers in diameter (PM2.5). Dimension: 20 PM2.5 are equal to the diameter of a human hair

## **2006**

The classification of nanoparticles as pollutants cause concerns. Particles the size of one-thousandth of a millimeter.

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### **Local impacts:**

- \*Health hazards
- \*Changes in city meteorology

### **Regional impacts:**

- \*Damages to the agricultural and natural ecosystems.
- \*Poor visibility
- \*Changes in the regional meteorology

### **Global impacts:**

- \*Climate change

*Source: MILAGRO Project*