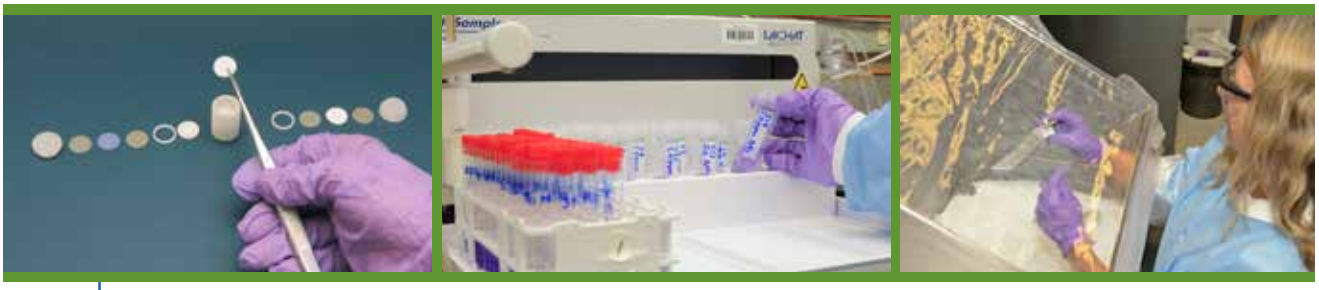
# Passive Sampling and Analysis of Ambient Atmospheres



RTI International's researchers in environmental chemistry are expert in providing technical support in passive sampling and analysis to state and federal agencies and commercial clients. With a staff of experienced scientists and state-of the-art laboratories and equipment, RTI provides data of the highest quality, which enables our clients to make informed decisions about their programs.

## Overview

There is frequently a need to monitor for pollutant gases in remote locations and in developing countries where funding or availability of power sources is of concern. RTI's passive samplers are inexpensive, require no electricity, and are easily deployed. They are small, lightweight, and can ship internationally without the need for FDA clearance.

RTI has assisted clients in monitoring large areas to identify hotspots of pollutant gases such as $NO_X$, $NO_2$, $SO_2$, $O_3$, and $NH_3$. We have monitored ozone at different heights (e.g., ground level and treetops) for studies on vegetation damage, and we have monitored museums, libraries, and archives for indoor pollutants according to the National Archives and Records Administration (NARA) Directive 1571.

## Areas of Expertise

Our researchers have expertise with passive sampler loading and shipping, extraction, and analysis of exposed collection pads using ion chromatography for $NO_2$, $O_3$, $NH_3$ and $SO_2$. We are also highly skilled with extraction and analysis of exposed collection pads—using an automated flow injection colorimetric method for reporting of atmospheric concentrations in ppb—for $NO_X$, $NO_2$, and $NH_3$.

RTI has 16 ion chromatographs, including conductivity and electrochemical detectors, autosamplers, and Chromeleon and PeakNet workstations. We also have a Lachat automated flow injection system, ultrasonicators, calibrated automatic pipettes, and sample handling and archiving facilities.

## Project Highlights

RTI's passive sampling program has been used on five continents and in over 55 countries; several project examples follow.

For the Air Quality Monitoring Capacity Building Project for Accra, Ghana and Dar es Salaam, Tanzania, RTI personnel worked with local stakeholder committees of individuals from government ministries, academic institutions, and non-governmental organizations to obtain data that were used to assess the range of emission levels of atmospheric pollutants and the degree of potential human health effects related to exposure. Our staff set up 10 air monitoring sites in Accra and 13 sites in Dar es Salaam. Ogawa passive samplers were used to measure atmospheric concentrations of $O_3$, $NO_2$, and $SO_2$ at residential, commercial, industrial, and roadside sites.

# Passive Sampling and Analysis of Ambient Atmospheres

RTI also provided sampling and analysis support to Urban Environment and Childhood Asthma Study. An especially high incidence of wheezing illnesses and childhood asthma has been observed in poor urban areas. Since 2005, RTI has assisted in the study by loading passive samplers for $NO_2$ collection and distributing them to centers in urban areas of Baltimore, Boston, New York City, and St. Louis. The exposed samplers are returned to RTI for analysis and calculation of ambient $NO_2$ concentrations to which the children are exposed.

Since 2008, RTI has analyzed passive $NO_2$, $NO_X$, $SO_2$, and $O_3$ samples for the Center for the Biology of Natural Systems as part of the New York City Community air survey. By matching our results with data they collected on asthma, emphysema, and other health problems, the New York Department of Health and Mental Hygiene will gain a better understanding of how reducing air pollutant gases can improve human health.

Additionally RTI has a passive sampling presence in the following countries: Mexico, Kosovo, Nigeria, Mongolia, Germany, Spain, Slovakia, Canada, Guatemala, Nicaragua, Peru, Ecuador, Hong Kong, South Korea, and Malaysia.

**Passive Sampling and Analysis Instrumentation and Equipment**

- Ogawa passive samplers
- Sixteen ion chromatographs, including conductivity and electrochemical detectors, autosamplers, and Chromeleon and PeakNet workstations
- Lachat automated flow injection for $NO_X$, $NO_2$, ammonium
- Ultrasonicators
- Calibrated automatic pipettes
- Millipore 18 MΩ DI water systems
- Purgeable glove boxes

**More Information**

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