



Organization of
American States



NIST
National Institute of
Standards and Technology
U.S. Department of Commerce

**Taller de Entrenamiento
en análisis de gases para el cambio climático:
emisiones fijas y móviles, GEI y niveles ambientales**

**8-10 de septiembre, 2015
CENAM, Querétaro, México**



**Training Workshop on gas analysis for climate change:
Stack and mobile emissions, GHGs and environmental levels**

**September 8-10, 2015
CENAM, Queretaro, Mexico**





September 8, 2015 Tuesday	
Day 1 : Session A – Institutional Awareness/ Día 1- Conciencia Institucional	
Theme: Do we have the right policies in place? / Tema - ¿Tenemos las políticas adecuadas?	
8:30	Travel to CENAM from Hotel and Registration/ Registro
9:00	Welcoming Remarks/ Palabras de Bienvenida Opening Address/ Discurso Inaugural CENAM – , General Director of CENAM or of Metrology of Materials?, CENAM México OAS – Ruben Contreras , Senior Energy and Climate Change Specialist, OAS/OEA NIST – Dr. Claire Saundry , Director/Directora, International and Academic Affairs, NIST
9:30 – 10:00	<i>Scope of the workshop and its relation with climate change/ Alcance del taller de entrenamiento y su relación con el cambio climático</i> Jorge Koelliker, Scientific Coordinator Gas Metrology Group, CENAM / Jorge Koelliker , Coordinador Científico del Grupo de Metrología de Gases, CENAM, Mexico
10:00 – 10:30	<i>Regulations of air pollutants: why and how are they regulated?/ Normativa en contaminantes del aire: ¿por qué y cómo están regulados?</i> Jorge Koelliker, Scientific Coordinator Gas Metrology Group, CENAM / Jorge Koelliker , Coordinador Científico del Grupo de Metrología de Gases, CENAM, Mexico
10:30	<i>Break/Pausa</i>
11:00 – 11:30	<i>Methods and technologies for assays versus those for development of measurement standards / Métodos y tecnologías para ensayos contra aquellos para el desarrollo de patrones de medida</i> General remarks and technologies for gas standards in CENAM / Jorge Koelliker , CENAM
11:30 – 12:00	<i>Technologies for gas standards and gaseous environmental assays / Lyn Gameson, NIST</i>
12:00-12:30	<i>Introduction to traceability in gas analysis / Jorge Koelliker, CENAM</i>
12:30	<i>Lunch / Almuerzo</i>

September 8, 2015 Tuesday	
Day 1: Session B – Technical Workshop/ Día 1- Taller Técnico	
Theme: Introduction to the Preparation and Certification of Gas Mixtures	
Tema:	
14:00 – 14:40	<i>Introduction to the Preparation of gas mixtures by the gravimetric method / Francisco Rangel CENAM</i>
14:40 – 15:20	<i>Introduction to the Certification of gas mixtures / Carlos Ramirez CENAM</i>
15:20 – 15:40	<i>Break/Pausa</i>
15:40 – 16:10	<i>Visit to the preparation laboratory of gas mixtures and explanation of the preparation of a gaseous PRMs / Francisco Rangel, CENAM</i>
16:10 – 17:00	<i>Visit to the gas analysis laboratory and hands on the certification of a 800 µmol/mol NO/N₂ gas mixture for stack/vehicle emissions / Carlos Ramirez and Francisco Rangel, CENAM</i>
17:15	<i>Travel back to your hotel</i>



September 9, 2015 Wednesday	
Day 2 : Technical Workshop / Día 2- Taller Técnico	
Theme: Certification of Gas Mixtures and Mobile Emission Programs	
8:30	Travel to CENAM from Hotel and Registration/ Registro
9:00 – 9:30	Calculations for the certification of gas mixtures / Carlos Ramirez CENAM
9:30 – 10:00	<i>Certification of Gas mixtures according to NIST Programs / Lyn Gameson, NIST</i>
10:00 – 10:30	<i>Implementation of regulations in the mobile emission programs / Jorge Koelliker CENAM</i>
10:30	<i>Break/Pausa</i>
11:00 – 11:30	<i>Needs of CRMs and NIST services in the mobile emissions programs / Lyn Gameson, NIST</i> (e.g. EPA verification program carried out by NIST)
11:30-12:00	<i>Sampling of CRMs and gas mixtures / Jorge Koelliker, CENAM</i>
12:00-12:30	<i>Questions of participants</i>
12:30	<i>Lunch / Almuerzo</i>

September 9, 2015 Wednesday	
Day 1: Session B – Technical Workshop/ Día 1- Taller Técnico	
Theme: Certification of Gas Mixtures and Mobile Emission Programs	
14:00 – 15:00	<i>Hands on measurement of propane/N₂ binary mixture by GC-FID for mobile emissions (group 1) / Carlos Ramirez CENAM</i> <i>Hands on measurement of a 25 µmol/mol CO/N₂ binary mixture by NDIR for ambient air levels (group 2) / Manuel Avila CENAM</i>
15:00 – 16:00	<i>Hands on measurement of a 25 µmol/mol CO/N₂ binary mixture by NDIR for ambient air levels (group 1) / Manuel Avila CENAM</i> <i>Hands on measurement of propane/N₂ binary mixture by GC-FID for mobile emissions (group 2) / Carlos Ramirez CENAM</i>
16:00 – 16:20	<i>Break/Pausa</i>
16:20 – 17:00	<i>Visit to the gas analysis laboratory to explain gas services / Gas analysis group, CENAM</i>
17:15	<i>Travel back to your hotel</i>



September 10, 2015 Thursday

Day 3 : Technical Workshop / Día 3- Taller Técnico
Theme: Stack Emissions, Air Quality and GHGs measurements

8:30	Travel to CENAM from Hotel and Registration/ Registro
9:00 – 9:30	Stack emissions CRMs, implementation of regulations and restrictions / Jorge Koelliker CENAM Topic of technical limitations of NMI and difficulties in Latin American Countries
9:30 – 10:30	Flow measurement capabilities needed to carry out assays of stack emissions / Flow person from NIST Maybe help from Lyn G. to carry out interference studies in multicomponent gas mixtures
10:30	Break/Pausa
11:00 – 11:30	Air quality measurement standards as implemented in Mexico / Jorge Koelliker CENAM Feedback of the topic as implemented in the USA and by NIST
11:30-12:00	Measurements of GHGs WMO requirements for GHGs and current situation in comparisons / Jorge Koelliker CENAM Certification of CRMs from NIST for GHGs. Lyn Gameson or Jerry R., NIST
12:00-12:30	Questions of participants
12:30	Lunch / Almuerzo

September 10, 2015 Thursday

Day 3: Session B – Technical Workshop/ Día 3- Taller Técnico
Theme: Stack Emissions, Air Quality and GHGs measurements

14:00 – 15:00	Hands on measurement of methane by GC-FID for GHGs (group 1) / Carlos Ramirez CENAM Hands on measurement of CO2/N₂ by GC-FID for GHGs (group 2) / Francisco Rangel CENAM
15:00 – 16:00	Hands on measurement of CO2/N₂ by GC-FID for GHGs (group 1) / Francisco Rangel CENAM Hands on measurement of methane by GC-FID for GHGs (group 2) / Carlos Ramirez CENAM
16:00 – 16:20	Break/Pausa
16:00 – 17:00	Questions and Closing Remarks / Preguntas y Palabras de Cierre
17:15	Travel back to your hotel



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Acronyms / **Siglas**