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Traceability in Chemical Measurement

S K Wong
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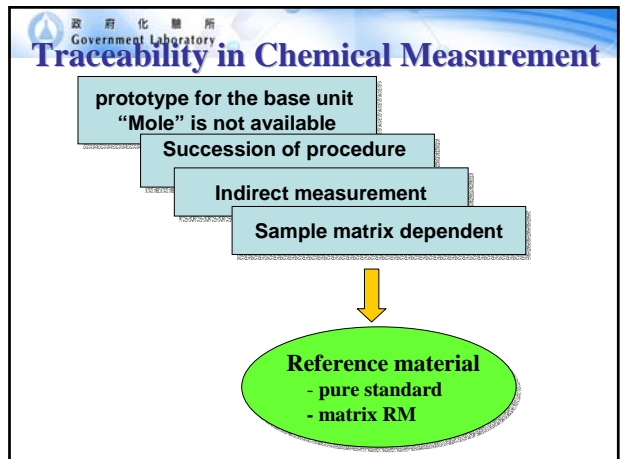
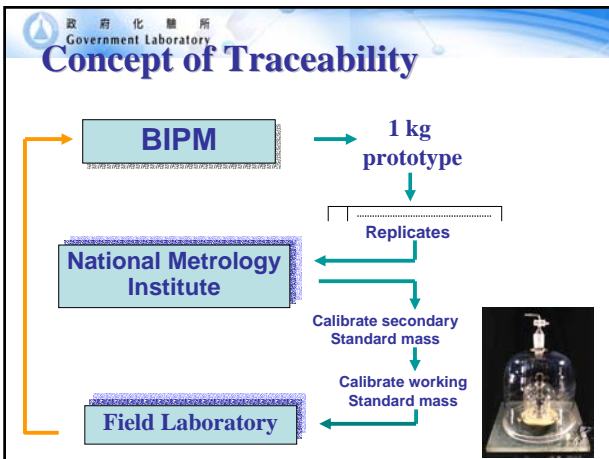
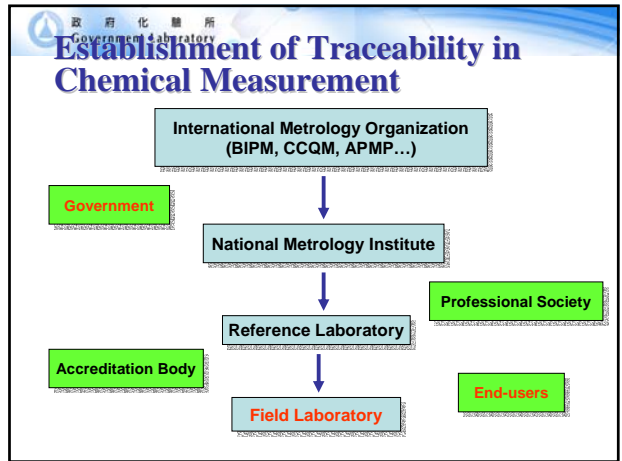
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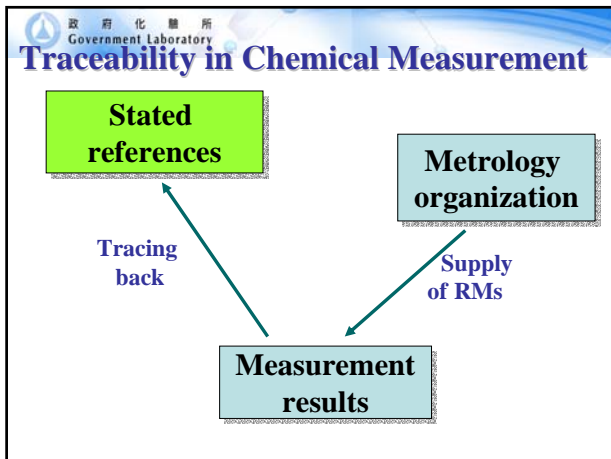
Traceability is the property of a result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties.

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Establishment of Traceability in Chemical Measurement

Who has a role to play?



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Supply of reference materials

COMAR Database
(COde d'indexation des MAteriaux de Reference)

- ◆ 200 producers from 27 countries
- ◆ around 11,000 entries

■ Ferrous reference materials	■ Reference materials for physical properties
■ Non ferrous reference materials	■ Biological and clinical reference materials
■ Inorganic reference materials	■ Reference materials for the quality of life
■ Organic reference materials	■ Reference materials for industry

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Supply of reference materials

The role of government

- Policy
 - ◆ China: - National RMs are approved and issued by the State General Administration for Quality Supervision & Inspection & Quarantine (AQSIQ) according to the Law on Metrology
 - ◆ Japan: - Development & supply of certified RMs is based on the traceability system according to the Measurement Law
- Financial
 - ◆ support for RMs' development & production

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Supply of reference materials

- Europe

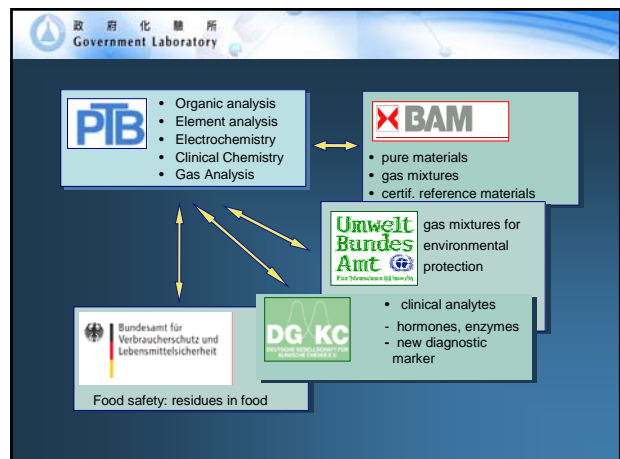
Funding (thousand €)	CRM
344	CRMs for the determination of SO ₂ , NO ₂ , CO & benzene in ambient air
2079	High quality CRMs for Dioxins analyses in food
1185	CRMs for molecular genetic testing
987	CRMs for detecting banned azo dyes used in leather industry
- Other examples
 - ◆ Japan (iron & steel)
 - ◆ Korea (gas: methane, CO, CO₂, etc.)
 - ◆ Malaysia (petroleum & liquefied natural gas)

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Supply of reference materials

The roles of other parties:

- International metrology organizations
 - ◆ organize inter-comparison programme (CCQM)
 - ◆ committee and working group (e.g. JCTLM)
- Accreditation bodies
 - ◆ accreditation according to ISO Guide 34
- National metrology institutes
 - ◆ establish national measurement standards
 - ◆ development of primary / higher order methods
 - ◆ increase the scope of RMs




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Traceable to Stated Reference

The role of end-user

- ◆ understand your metrological requirements
 - stated reference for traceability
 - S.I. Unit (primary methods)
 - agreed reference (WHO international unit)
 - national standards (NMI)
 - CRMs (NMI)
 - CRMs (consensus value)
 - standard/official method (AOAC, ECBS/WHO)
 - measurement uncertainty



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Traceable to Stated Reference

The role of field laboratory

- ◆ use appropriate RMs/CRMs whenever they are available
- ◆ other types of traceability
 - physical measurements involved (e.g. mass, volume)
 - values of the specified conditions (e.g. temp.)
 - system (sample materials, equipment, raw data)
- ◆ statistical control

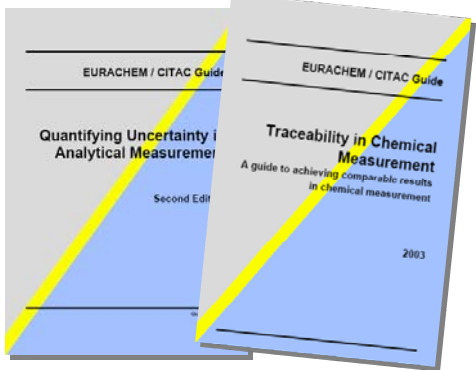
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Traceable to Stated Reference

The roles of other parties:

- Reference laboratories
 - ◆ participate in certification of CRMs
 - ◆ assist in developing standard/official methods
- Professional societies
 - ◆ publish standard/official methods (AOAC, IFCC)
 - ◆ guidelines, training & workshop (CITAC, Eurachem)

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Current development in HK


- National metrology institute ?
 - ◆ Standard & Calibration Laboratory (ITC)
 - function as a NMI for physical metrology
 - ◆ Government Laboratory
 - Designated metrology institute for chemical metrology
- Traceability chain ?
 - ◆ using RM/CRMs provided by other NMIs or CRM producers
 - ◆ relevant standard/official methods

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Role of Government Laboratory

Provide traceability link

Promote awareness



To conclude:

You have a unique
role to play !

Traceability



Thank you !

