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The UK valid analytical measurement program for ultrafine particles

The UK Valid Analytical Measurement Programme for Ultrafine Particles

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AEA Technology

Valid Analytical Measurement Programme

- DTI-funded
- Measurement infrastructure
- Fit-for purpose analytical measurements
- Three main technical themes
  - Physical
  - Biological
  - Chemical

- www.vam.org.uk

VAM Principles

- Analytical measurements should be made to satisfy an agreed requirement.
- Analytical measurements should be made using methods and equipment which have been tested to ensure they are fit for purpose.
- Staff making analytical measurements should be both qualified and competent to undertake the task.

VAM
VALID ANALYTICAL MEASUREMENT

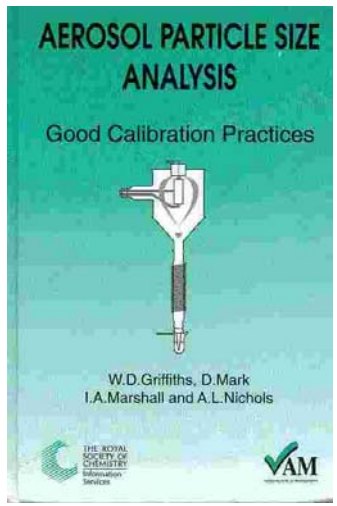
VAM Principles

- There should be a regular independent assessment of the technical performance of a laboratory.
- Analytical measurements made in one location should be consistent with those elsewhere.
- Organisations making analytical measurements should have well defined quality control and quality assurance procedures.

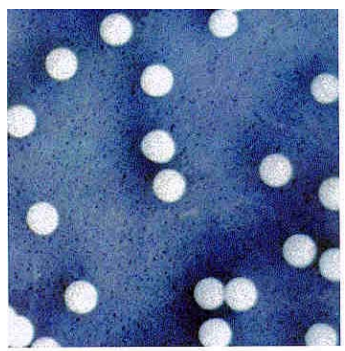
VAM
VALID ANALYTICAL MEASUREMENT

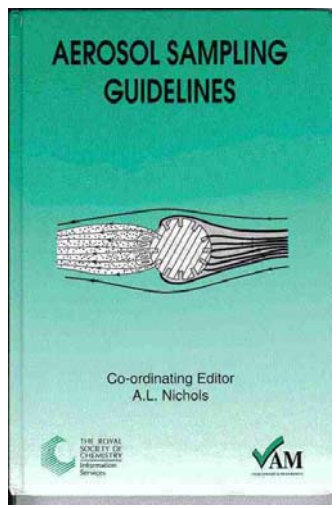
VAM In Practice

- Designed to control all factors that might affect the reliability of analytical results thereby reducing the cost and risk of unreliable measurements.
  - Publications
  - Training and Education
  - Reference Materials
  - Proficiency Testing



VPEC





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VAM Physical Theme 2001 - 2003

- Electrical Methods
  - pH/conductivity standards
- Surface Analysis
  - Atoms/molecules at surfaces
  - Nanoscopic analysis
- Gases and Particles
  - Gas standards
  - Particulate Measurements
    - ➔ Ultrafine
    - $PM_{10}/PM_{2.5}$

→ Ultrafine Particles

- Address sampling issues
- Determine how measuring the dynamic aerosol system affects different types of instrumentation
- Develop methodologies such that different instruments give comparable results
- Standardise ultrafine particle measurement so that it is not instrument dependant

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Approach

- **Instrumentation**
  - Choice
  - Calibration
    - Diameter
    - Concentration
  - Set-up
    - Flow Rates
    - Other parameters
  - Characterisation
    - Internal losses

  ⇨CONFIDENCE

- **Usage**
  - Dynamic system
  - Positioning
  - Sampling Arrangement
  - Concentration/Dilution
  - Solid/Liquid particles
  - Artefacts

  ⇨BEST PRACTICE

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Overview

- Consultation
  - choose candidate instruments
  - identify sampling issues
  - plan method development
- Development
  - Test and improve methods in laboratory and field
- Demonstration/Dissemination
  - Finalise and publicise methods

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Consultation

- Instrument choice
  - Electrical mobility
  - ELPI
  - Condensation particle counter
  - Others.....?
- Sampling Issues
  - Location
  - Sample line design
  - Dilution effects
  - Liquid droplets
  - Others.....?

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VALID ANALYTICAL MEASUREMENT

Consultation

- Vehicle Particle Emission Club
  - www.aeat.co/vpec
  - Feedback form
    - Priorities: Instruments & Sampling Issues
    - Information sources
    - Duplication awareness

- All contributions appreciated

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