

Particle Measurement Programme

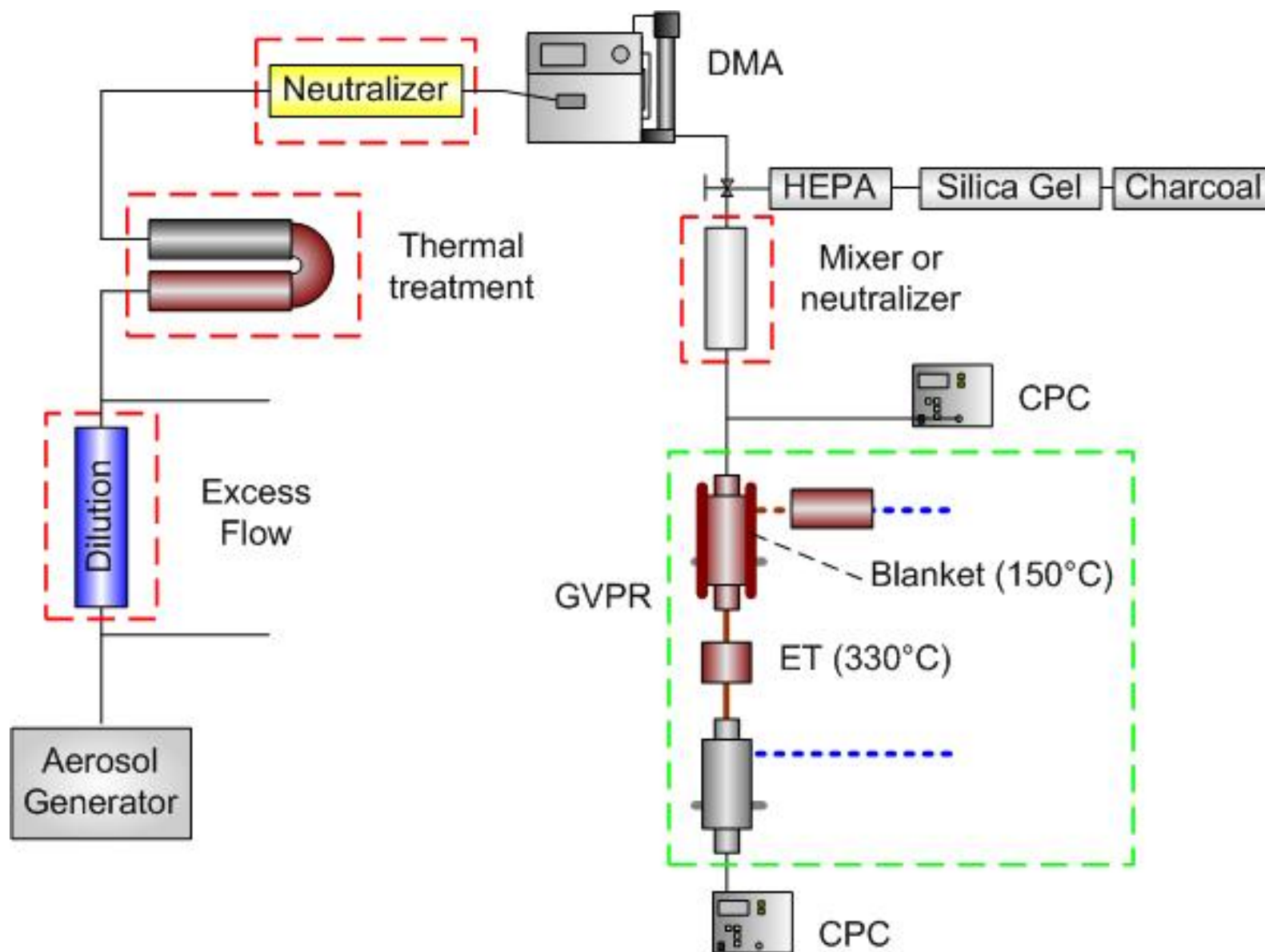
Volatile Particle Remover Calibration

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- JRC's dual ejector system (Dekati) unless any manufacturer is willing to provide another VPR system.
- The system was already sent to the manufacturer for maintenance and modifications (a pressure transducer and a thermocouple will be introduced for the determination of the conditions at the sample point).
- An application (based on the model developed by Giechaskiel et al. Meas. Sci. Technol. 15 2199-2206) has already been developed which calculates the DF as a function of gas composition and the operating pressures – temperatures.

- LAT's Silver Particle Generator (utilizing heated tungsten wire).
- Produce spherical silver particles of small sizes. Most probably not suitable for 100 nm measurements.
- Can serve as an internal standard even if used only at 30 and 50 nm.

- Exploratory work at JRC (January – February 2009).
 - The start time and duration will depend on the availability of the equipment.
 - Calibration of the SPCS system also?
 - Use of the GVPR during the PMP Round Robin testing at JRC?
- Inter-laboratory testing at different labs (AVL, Horiba, Maha, Matter, Sokken, EMPA). Labs shall confirm their interest in participating and their availability in order to define the time schedule. The GVPR system shall be calibrated using the GAG as well as each lab's own particle generators.
- Workshop at JRC: Calibration of the GVPR with different aerosol generators and possibly chargers (UV, inipolar)?



- Characterization of the charging probabilities and their dependence on:
 - Neutralizer activity level (2 mCi, 10 mCi, no neutralizer).
 - Humidity and impurities in carrier gas.
 - Aerosol morphology and material (PAO, PSL, NaCl, Silver, CAST, Diesel Soot).
 - Other type of chargers.
- Aerosol conditioning:
 - Thermal treatment of different aerosols at different temperatures (150-400 °C)

- Production of monodisperse aerosol:
 - Possibility to avoid the use of neutralizers (stability of charge already carried by the particles, use of alternative chargers).
 - Necessity for neutralization of the produced monodisperse aerosol.
 - Concentration levels upstream the DMA (space charge effects, concentrations downstream the GVPR).
 - Accuracy of DMA operating flowrates and voltages (tests with PSL spheres).
 - Influence of the inlet size distribution on the accuracy of the results.

- Setup:
 - Operation of DMA in both overpressure and underpressure mode.
 - Sheath to Sample flow ratios.
 - Possibility to use a single CPC.
 - Effect of CPC cutoff size.
 - Necessity for correction of CPC indications for sample gas density.

- Simplification of the calibration procedure:
 - Poly-disperse check of the system (using two SMPS or operating the DMA in scanning mode).
 - Sufficiency of a single test at 50 nm.
 - Possibility to calibrate the components of the VPR individually (First ejector, ET + second ejector).

Thank you