

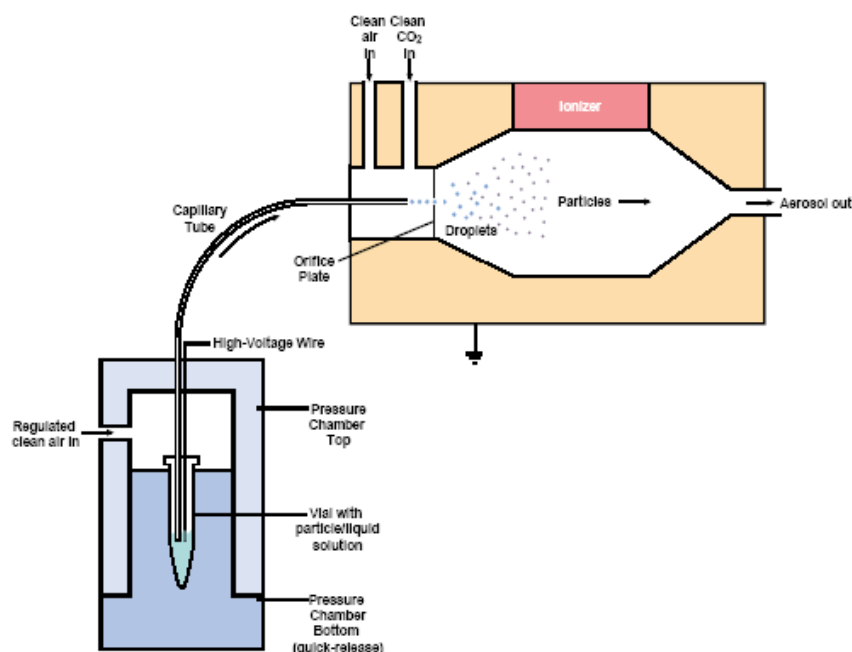
## Supplementary informations

### I. Electrospray aerosol generator Model 3480 (from TSI):

A method of generating nanometer particles is now available from TSI. The Model 3480 Electrospray Aerosol Generator produces stable, monodisperse, submicrometer aerosol in the range from less than 3 to greater than 100 nanometers. It achieves such small diameters by moving a conductive liquid solution or suspension through a capillary and applying an electrical field to the liquid at the capillary tip. The electrical field draws the liquid from the tip into a conical jet from which ultrafine charged droplets are emitted. Air and CO<sub>2</sub> are merged with the droplets, and the liquid evaporates while the charge is neutralized by an ionizer. The result is a neutralized, monodisperse aerosol that is practically free of solvent residue.

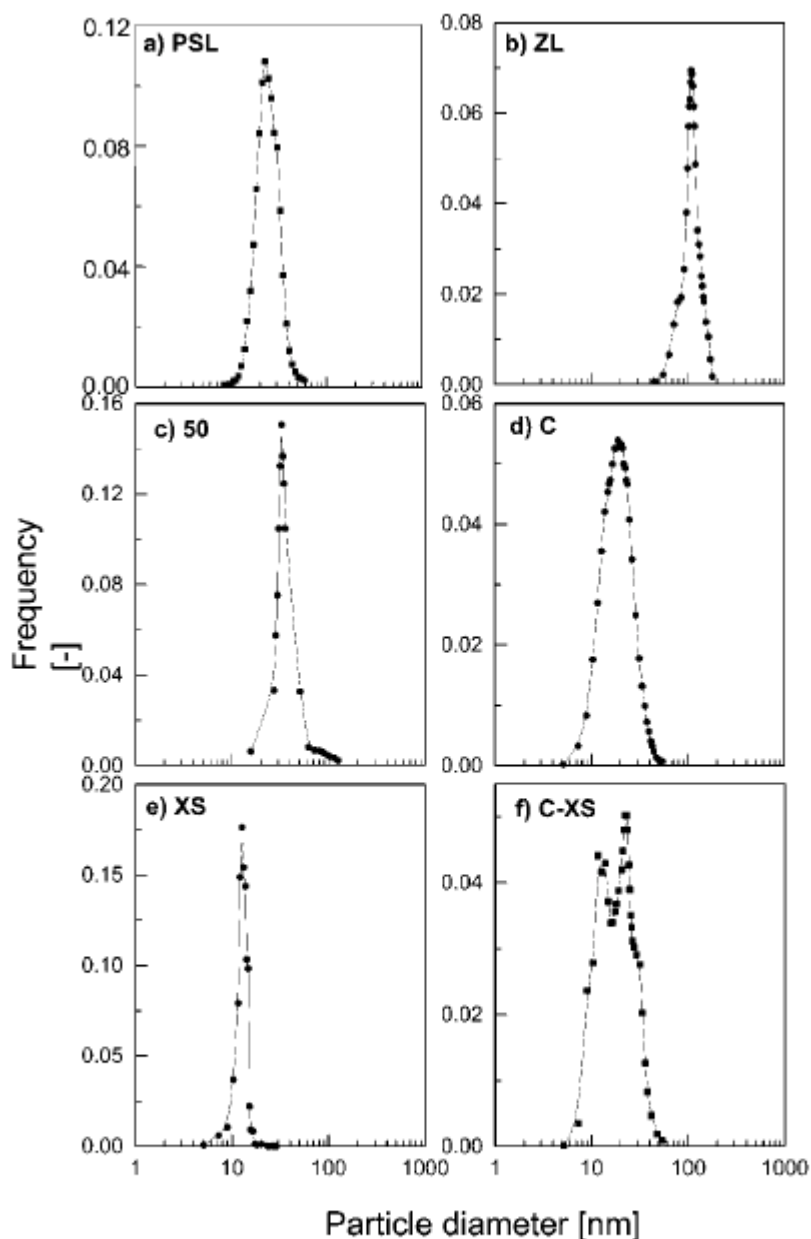


**Particle generation rate:**  $>10^7$  particles/cm<sup>3</sup>  
**Liquid conductivity:** 0.2 S/m nominal  
**Liquid flow rate:** 50 to 100 nL/min  
**Particle size range:** <3 to >100 nm  
**Initial droplet diameter:** 150 nm  
**Differential pressure:** 0 to 5 psi (3.0 psi nominal)  
**Air flow:** 0.2 to 2.5 L/min (1 L/min nominal)  
**CO<sub>2</sub> flow:** 0.05 to 0.5 L/min (0.1 L/min nominal)



One exemple of particle size distributions obtained by electrospray :

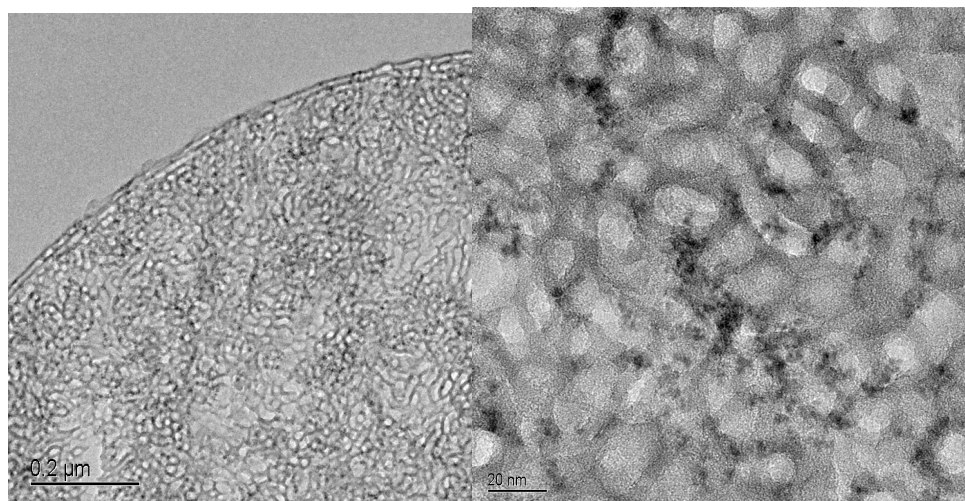
(taken from) Lenggono et al. Langmuir (2002), Vol 18, 12, 4584-4591



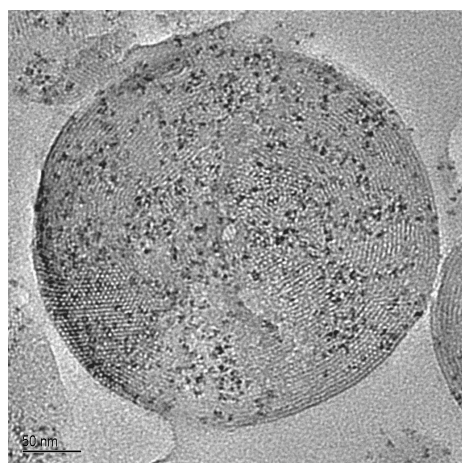
**Figure 5.** Measured particle size distributions of PSL (a) and various silica colloids, (b) ZL, (c) 50, (d) C, (e) XS, and (f) mixture of C and XS, at ambient temperature of 25 °C. The flow rates were set near the minimum value for  $Q_{\min}$  at each run.

## II. Mesoporous cerium oxide - silica microspheres

In previous work, the synthesis of various nanoparticle/mesoporous silica composites with narrow size distribution by spray drying has been already obtained. TEM micrographs of analogous mesoporous silica spheres containing CeO<sub>2</sub> are shown here after.



*P123-SiO<sub>2</sub>-CeO<sub>2</sub>*



*CTAB-SiO<sub>2</sub>-CeO<sub>2</sub>*