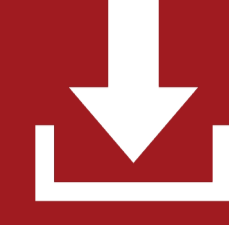


# Creating large sintered silver particles with an enhanced Silver Particle Generator and a Particle Sintering Device.



Short warm-up time (< 15 min)



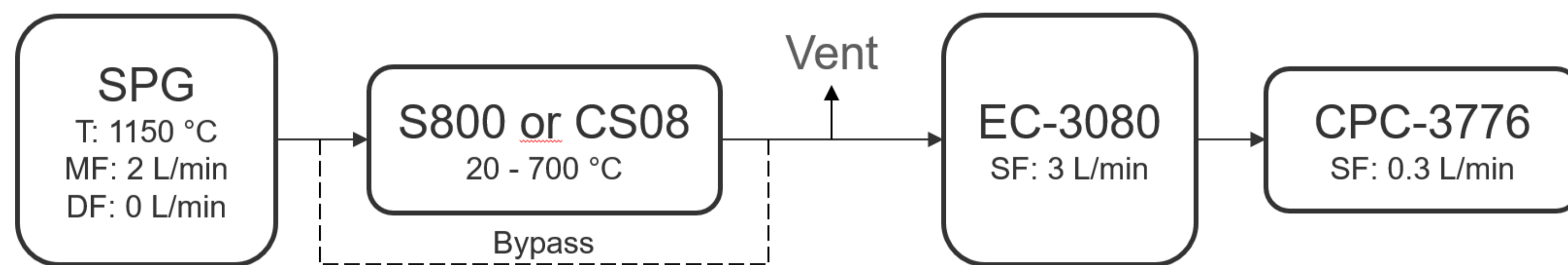
Remote data logging (USB, WLAN, LAN)



One-touch presets for size modes

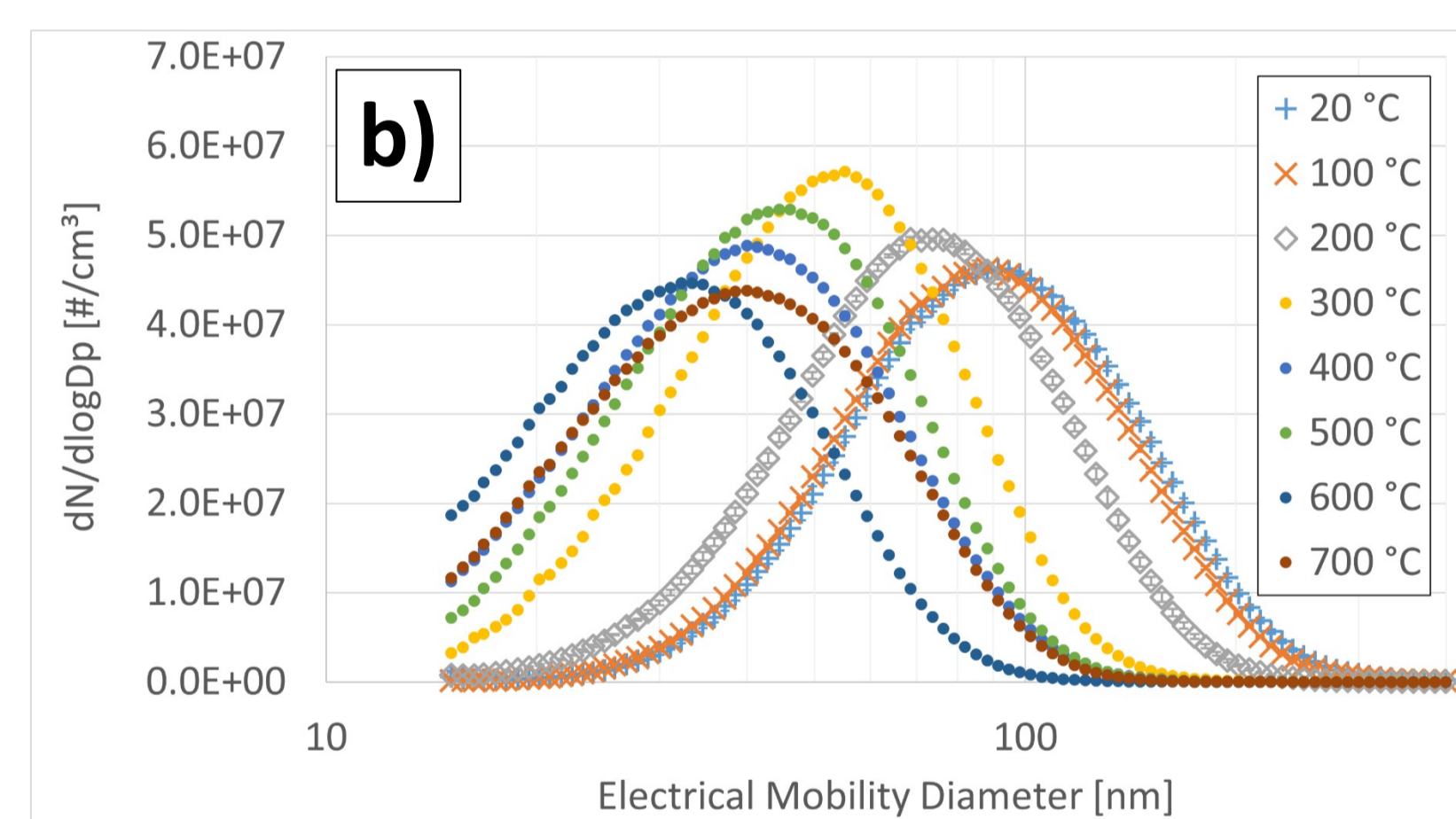
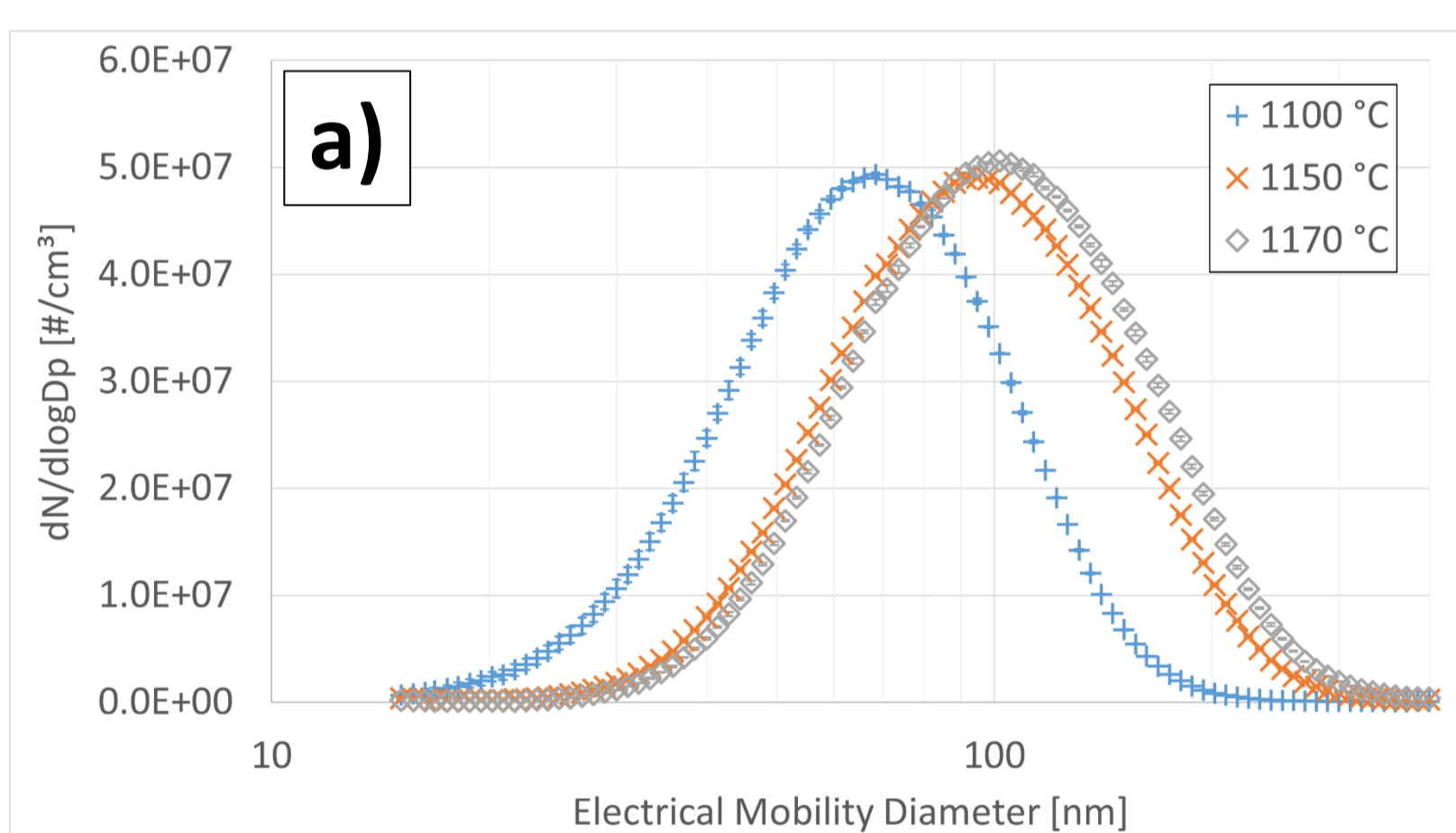
Experimental setup for the generation and characterisation of unsintered (bypass line) and sintered particles (S800 Particle Sintering Device stage or CS08 Catalytic Stripper).

- Sintering temperature varied between 20 and 700 °C
- Settings of SPG, EC and CPC constant for all sintering experiments



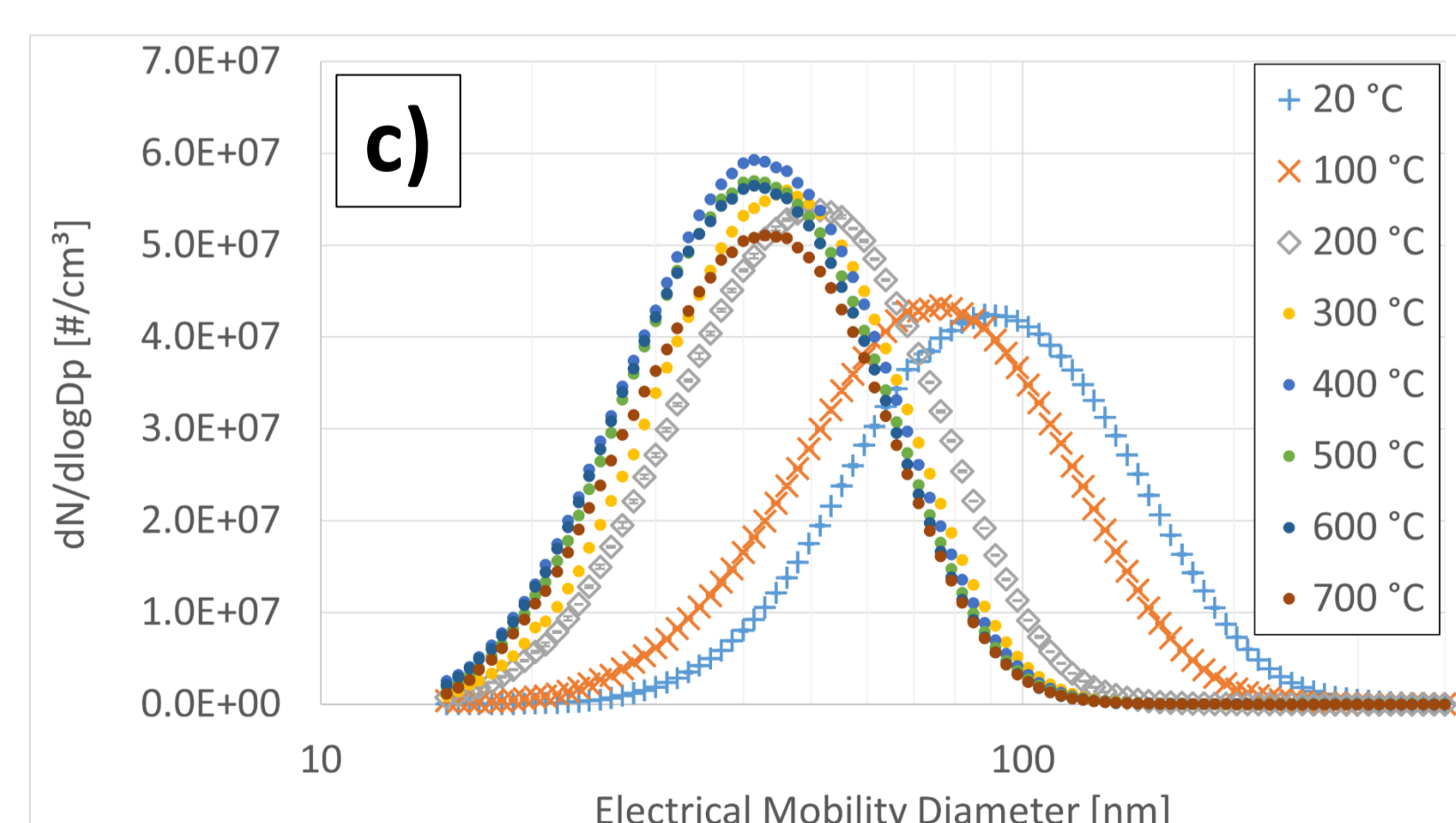
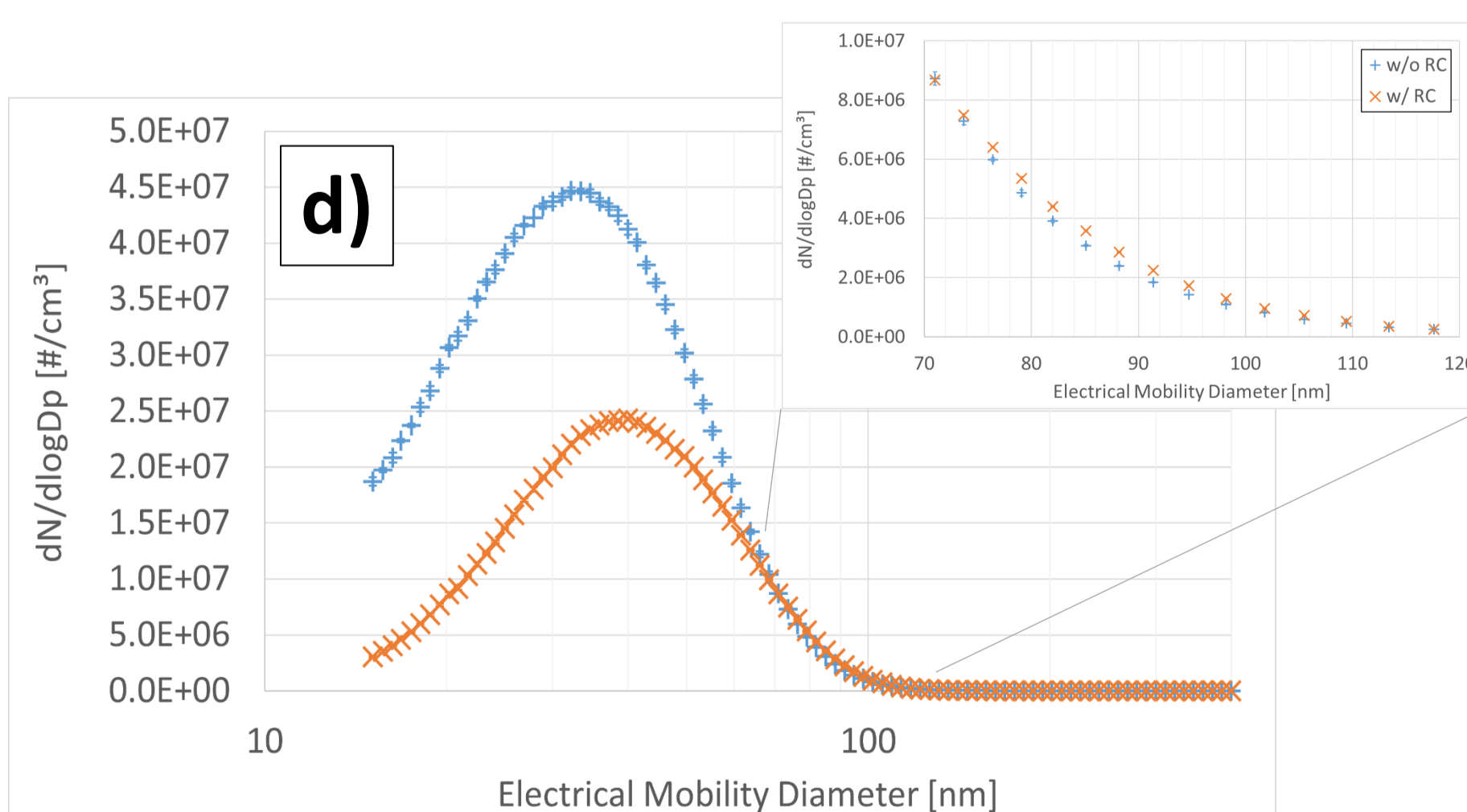
Increasing SPG temperature leads to larger particles due to more silver being available in the gas phase for particle formation.

S800 silver particle sintering starts below 200 °C. Although GMD scatter remains high, sintering is considered completed at 400 °C.



Introducing a Residence Chamber upstream the S800 to allow more agglomeration yields more sintered particles larger than 80 nm.

CS08 silver particle sintering starts below 100 °C. A constant GMD indicates that sintering is completed at 400 °C.



## Discussion

### a) SPG Particle Size Distribution

- GMD 100 nm achievable with high temp. option of SPG (1150 °C)
- CPC conc. limit restricted the max. SPG temp. that could be examined; dilution reduces GMD

### b) & c) S800 & CS08 Sintering

- Higher GMD scatter in b): limited experiment time led to poor temp. equilibrium during measurement
- Lower onset temp. of sintering with CS08 (c) potentially due to better heat transfer via catalyst substrate
- More experiment time and better temp. equilibrium during measurement with CS08 (c) leads to a constant GMD at 400 °C and above → sintering complete

### Graph d) Residence Chamber

- Residence Chamber creates more sintered particles larger than 80 nm at the expense of lower particle concentration at smaller sizes.

## Summary

High-temperature SPG generates silver aerosol with a GMD of 100 nm

S800 Particle Sintering Device or CS08 Catalytic Stripper can be used for sintering

With these devices, silver particle sintering is complete at 400 °C

A residence chamber enables 100 nm sintered silver particles

V. Berger<sup>1</sup>, H. Schulz<sup>1</sup>, E. Sorani<sup>1</sup>, A. Wu<sup>1</sup>, J. Swanson<sup>1,2</sup>, A. Boies<sup>1,3</sup>

<sup>1</sup>Catalytic Instruments GmbH & Co.KG, 83026 Rosenheim, Germany

<sup>2</sup>Minnesota State University, Mankato, MN 56001, United States

<sup>3</sup>University of Cambridge, Department of Engineering, Cambridge, CB2 1PZ, United Kingdom



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