Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig

Intercomparison of Condensation Particle Counter

Project No.:	*CPC-2019-4-5*
Principal Investigator:	Prof. Alfred Wiedensohler
Home Institution:	Leibniz Institute for Tropospheric Research Permoserstraße 15 04318 Leipzig, Germany
Participant:	–
Candidate:	WCCAP Reference CPC
Counter (SN):	TSI CPC Model 3772 #71011008
Location of the quality assurance:	TROPOS Leipzig, lab 130
Comparison period:	September 02, 2019
Last Intercomparison (with Project No.):	
TROPOS Reference Instrument:	Electrometer: TSI model 3068B #70838596, Last calibration in September 2018
Additional Equipment:	Bubble flow meter 'Gilibrator', Gilian (Sensidyne) #1711008-S, Last calibration in January 2018

Summary of Intercomparison

Status:
The candidate passed the quality standards of ACTRIS and GAW. The candidate reached 99% efficiency at 40 nm. The Dp50 is at 7.42 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

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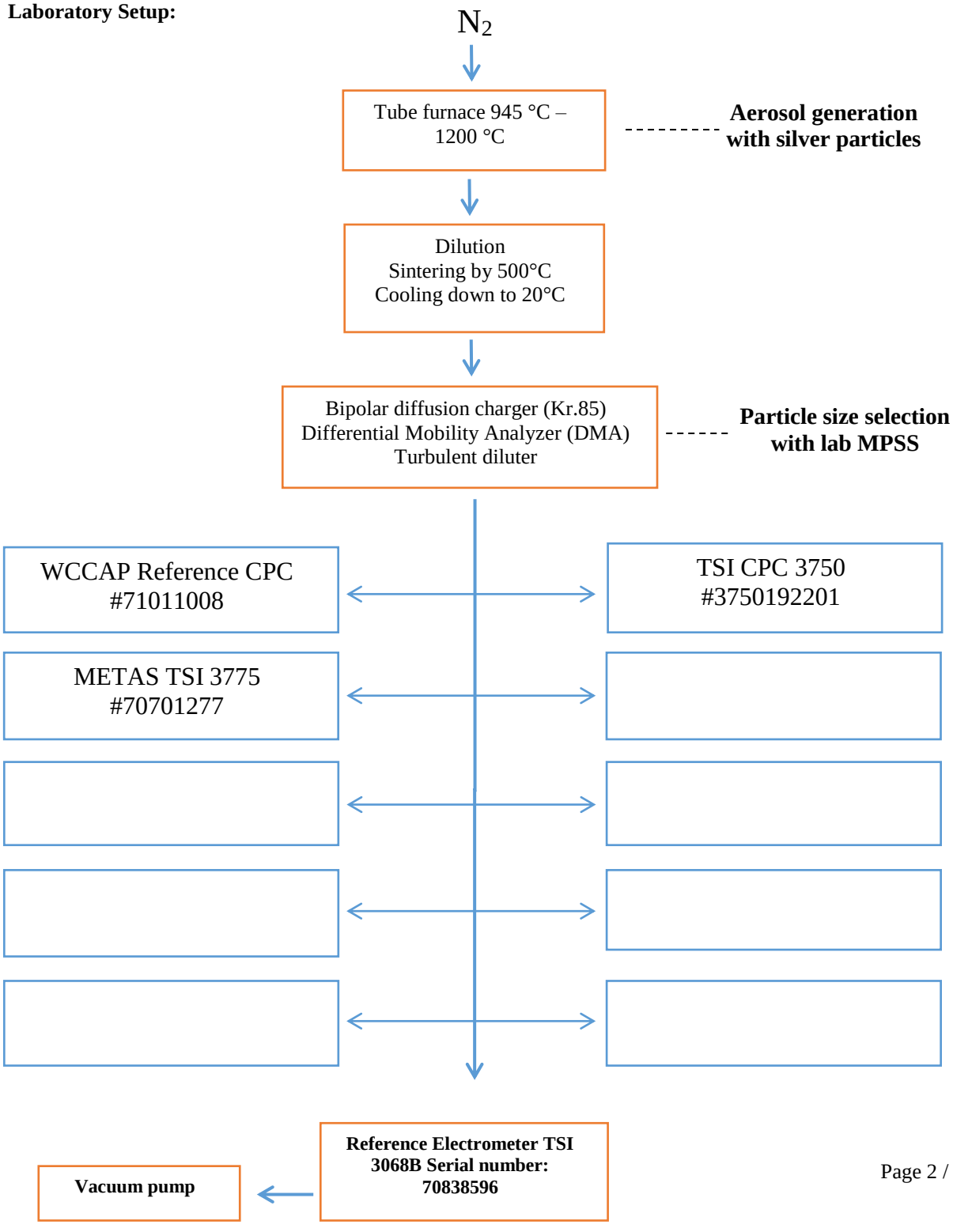
Laboratory Setup:



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Date of arrival of instrument in calibration lab:	*September 02, 2019*
Instrument:	*Condensation Particle Counter*
Model and serial number of instrument:	*CPC 3772 S/N 71011008*
Result of physical inspection:	*no damages*
Result of functional test:	*no repair*
Internal parameters of instrument	*nominal flow rate 1.0 l/min*
Model and identification number of aerosol electrometer:	*TSI Electrometer Model 3068, S/N 70838596*
Electrometer calibration certificate:	*September 05, 2018, calibrated at PTB Braunschweig*
Corrections of electrometer, for instance, differing flow rate:	*Within tolerance range (+/-2%); reference: 4.0 l/min, measured: 4.00 l/min*
Software for recording:	*LabView 2010; National Instruments; Program „LabCount.vi“*
Date of calibration:	*September 02, 2019*
Lab temperature and pressure:	*23°C, 999.48mbar*
Measured aerosol flow rate of CPC:	*0.984 l/min*
Uncertainty in measured flow rate:	*3%*
Flowmeter used:	*Gilian Gilibrator V; S/N 1711008-S, January, 2018*
Particles and gases used for calibration:	*silver particles and nitrogen*
Method of particle generation:	*tube furnace generator*
Zero measurement of instrument:	*0 particles/cm³ in 5 minutes*

Results (using pulse output):

Particle size (nm)	***40***	***30***	***20***	***15***	***10***
Number concentration (cm-3)	1188	1171	1675	1613	1143
Counting efficiency η	*0.99*	*0.98*	*0.98*	*0.95*	*0.78*
Particle size (nm)	***09***	***08***	***07***	***06***	***05***
Number concentration (cm-3)	1323	1009	793	409	6
Counting efficiency η	*0.70*	*0.58*	*0.42*	*0.19*	*0.01*
Particle size (nm)	***40***				
Number concentration (cm-3)	1130				
Counting efficiency η	*1.00*				

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Special Information regarding to the Candidate:

Was it necessary to:	yes/no	information
do a second run	no	-
clean the optics	no	-
clean the nozzle	no	-
clean the saturator	no	-
change the wick	no	-
change the laser	no	-
change internal settings	no	-

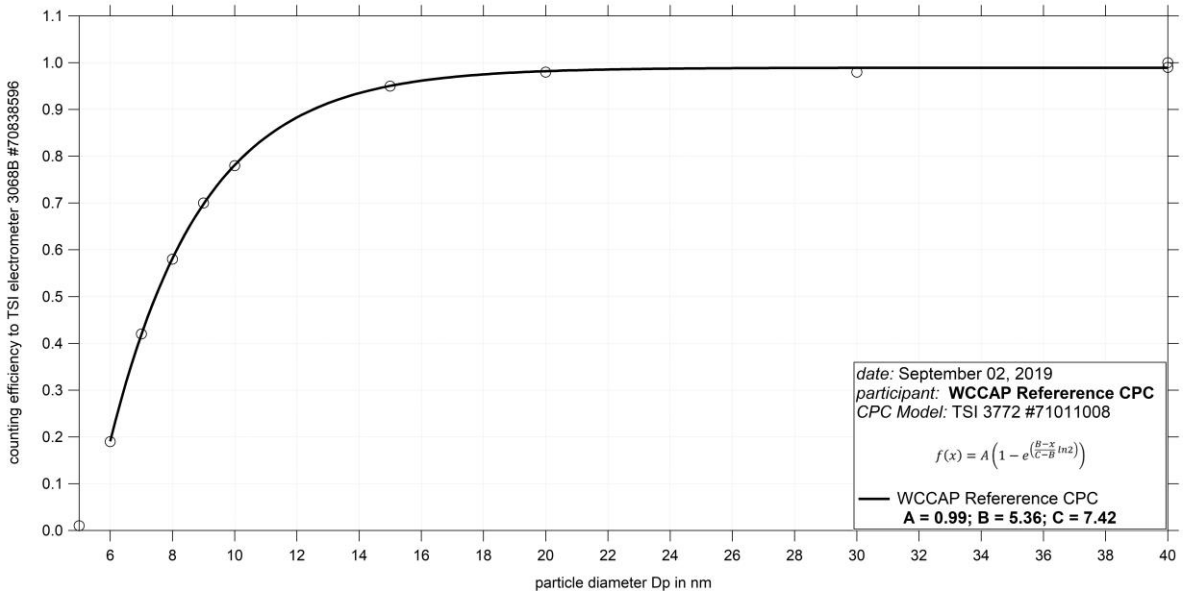

Fig. 1: Counting efficiency for WCCAP Reference CPC 3772 S/N 71011008 against aerosol electrometer 3068 S/N 70838596; silver particles between 6 and 40 nm were used for calibration; the calculated Dp50 is 7.42 nm.

Status information:

Status	***T SAT***	***T CON***	***T OPT***	***T CAB***	***P AMB***
from display	39	22	40	33.0	100.9
Status	***P OR***	***P NO***	***Laser***	***LV***	***flow***
from display	71.0	2.6	50	full	0.984

Date of issue: *September 02, 2019*
Reviewed: TROPOS / Kay Weinhold

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