VI-Aerosol Cloud Interactions
Annual Report 2008

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Activities Jülich- Group

Campaign AIDA IN11 at IMK in Karslruhe

Period: 19.11.2007 – 30.11.2007

NAUA and AIDA

Instruments: WToF-AMS (Christian Spindler)
DMT-CCN Spectrometer (Angela Buchholz)
HTDMA (Angela Buchholz)

Campaign LACIS FROST at IfT in Leipzig

Period: 01.04.2008 – 18.04.2008

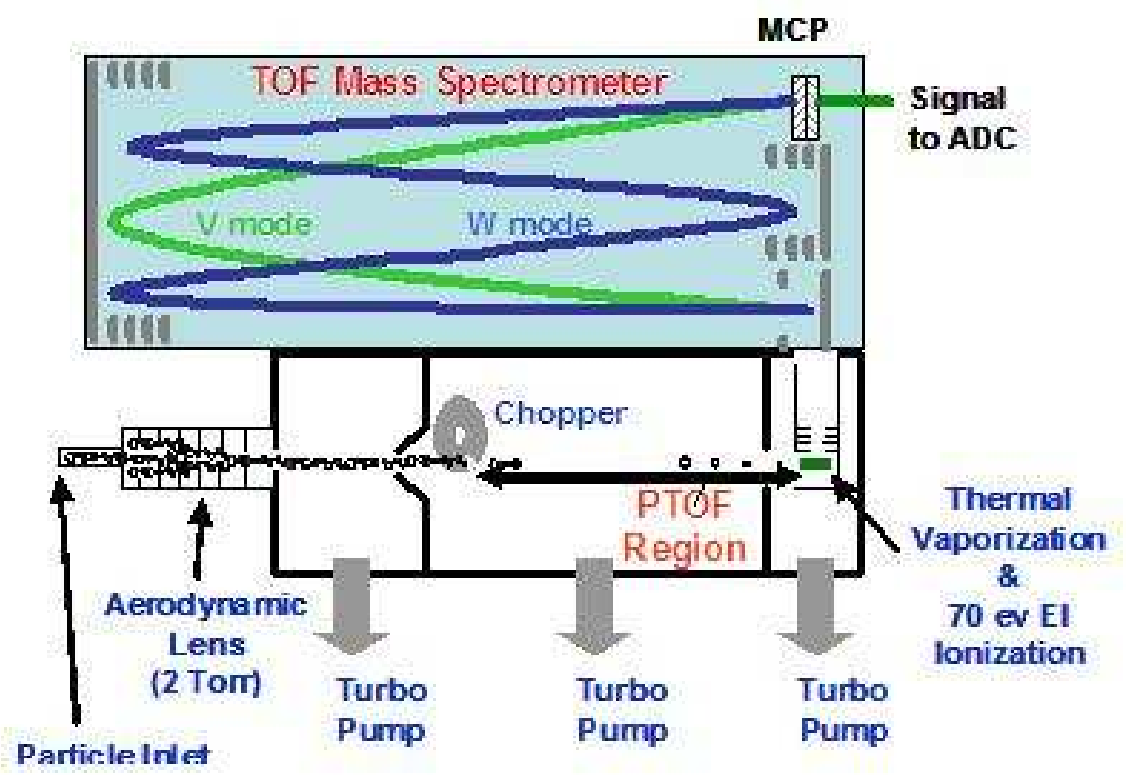
Instruments: WToF-AMS (Christian Spindler)

Status: Data evaluated

AMS Report: -> Johannes Schneider

Instrumentation of the Jülich-Group

WToF-AMS



Task:

- **Trace analysis of non-refractory coatings on refractory cores**

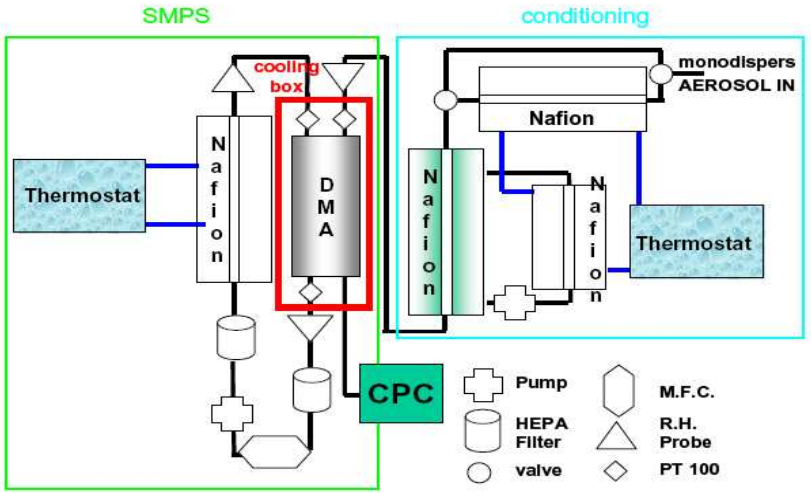
Goals:

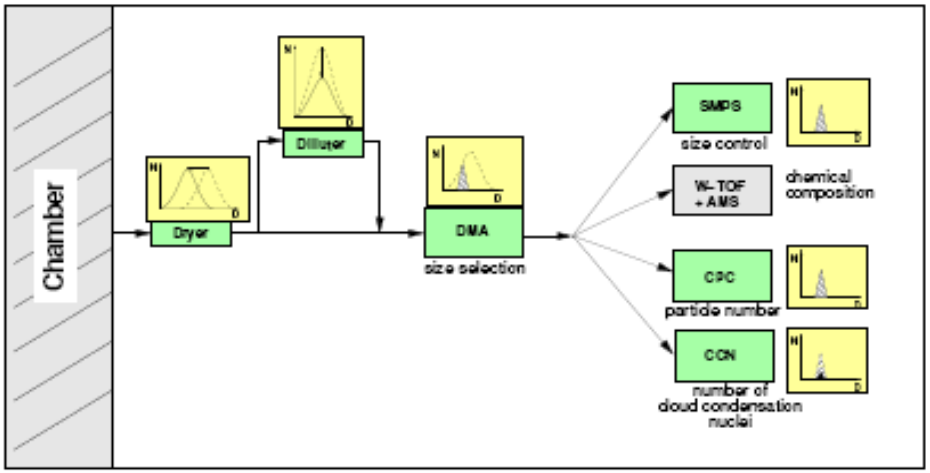
- **"quality control" of aerosol generation**
- **coating mass**
- **water soluble mass**
- **aerodynamic D_{va} – effective densities**
- **multiple charged particles**

Open:

- **quantification of refractory components mixed with non-refractory components**

Instrumentation of the Jülich-Group





Hygroscopicity Tandem - DMA

- Hygroscopic growth factors
- RH >95%

Laboratory Studies in Jülich
- HG of oxalic acid, oxalates
- HTDMA – Q-AMS coupling recrystallisation of oxalates

DMT CCN Spectrometer

- Critical diameter of droplet activation
- Critical supersaturation of droplet activation

- Test CCNC (2006, 2007)
- Calibration unit (2007)
- Compact setup and automatisation (pending)

Campaign AIDA IN11 at IMK in Karslruhe

NAUA - Chamber

spark generated soot (GFG) vs. propan flame soot (CAST)
- content of organic carbon (OC)

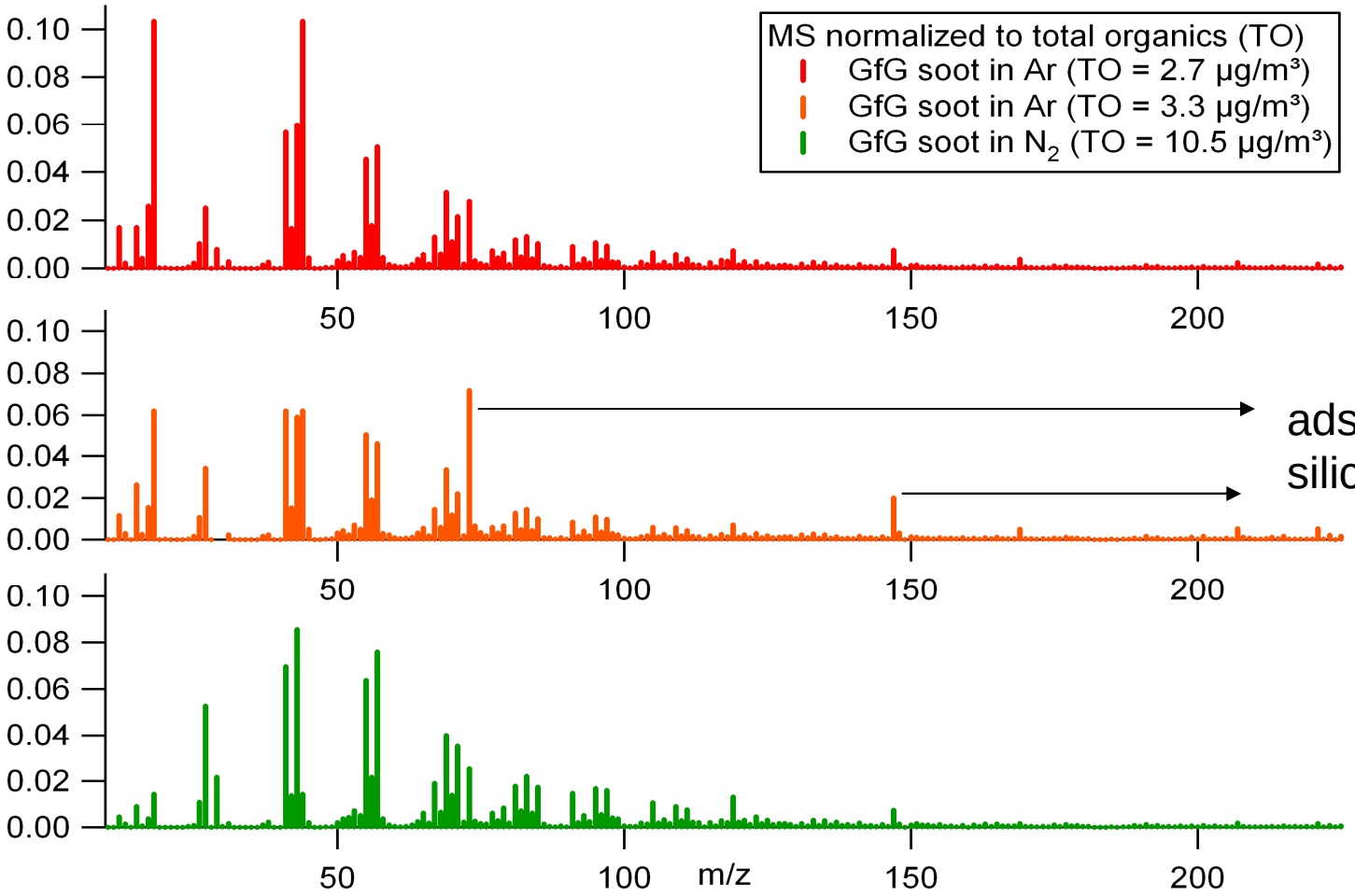
CAST soot, propan / O_2 ratio
- content of organic carbon
- composition of the organic fraction

CAST soot / OC / coatings
- sulfuric acid, coating thickness
- succinic acid

Status:

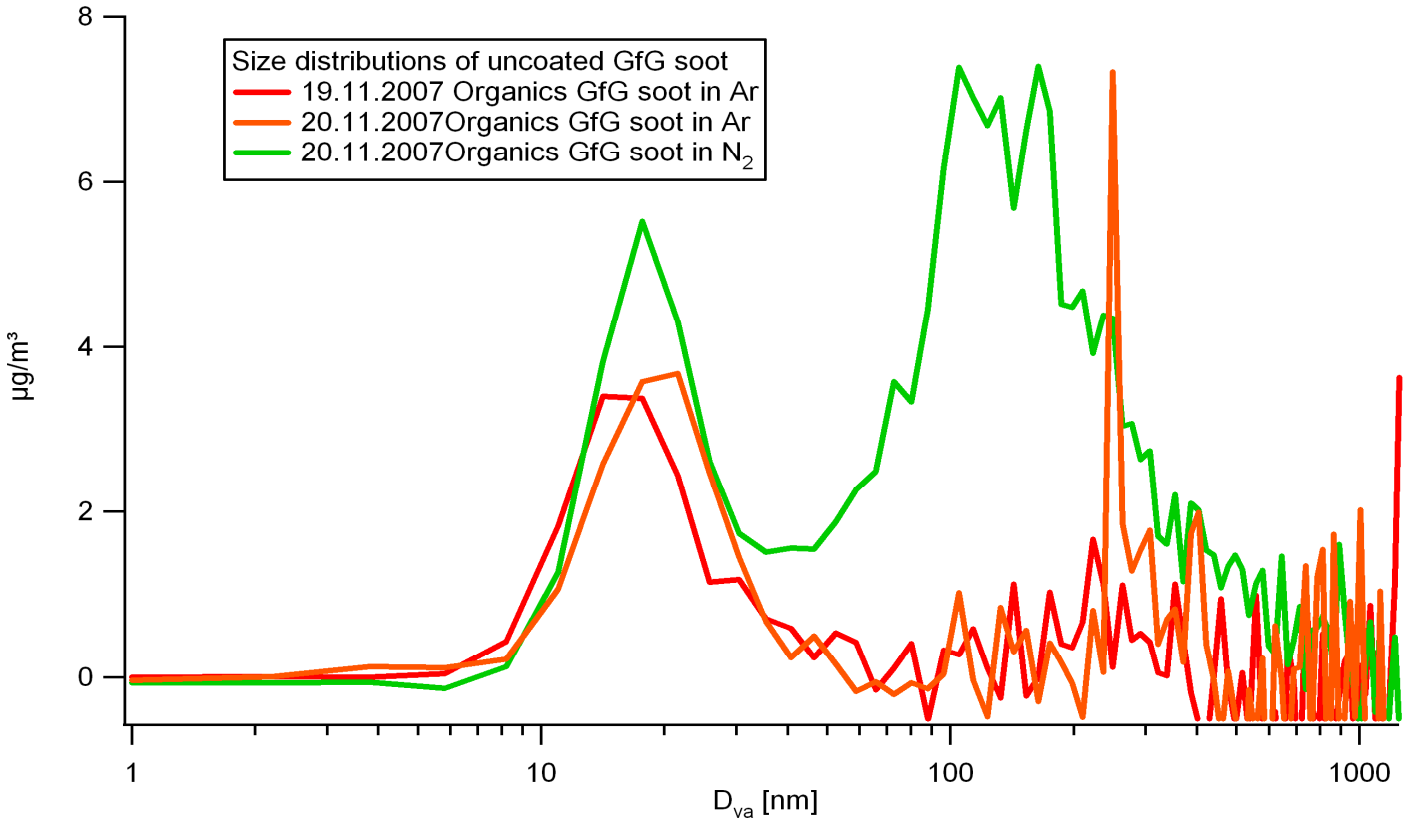
WToF-AMS	**raw data evaluation in progress**
DMT-CCN Spectrometer	**new software in preparation**
HTDMA	**raw data partly available**

GFG soot Ar vs. N_2



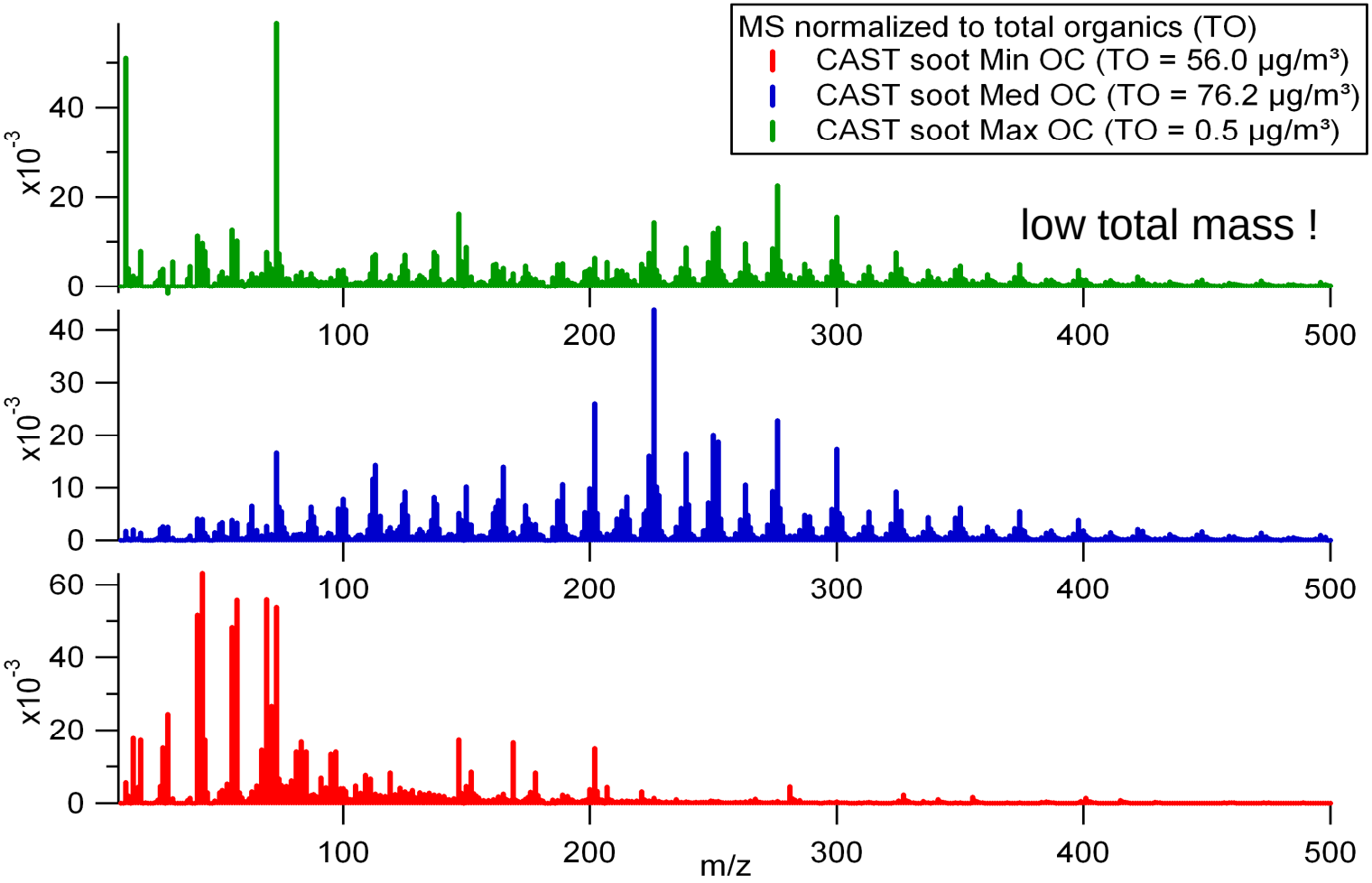
preliminary: m/z44 (CO2+) and m/z18(H2O+) larger in Ar case

GFG soot Ar vs. N_2



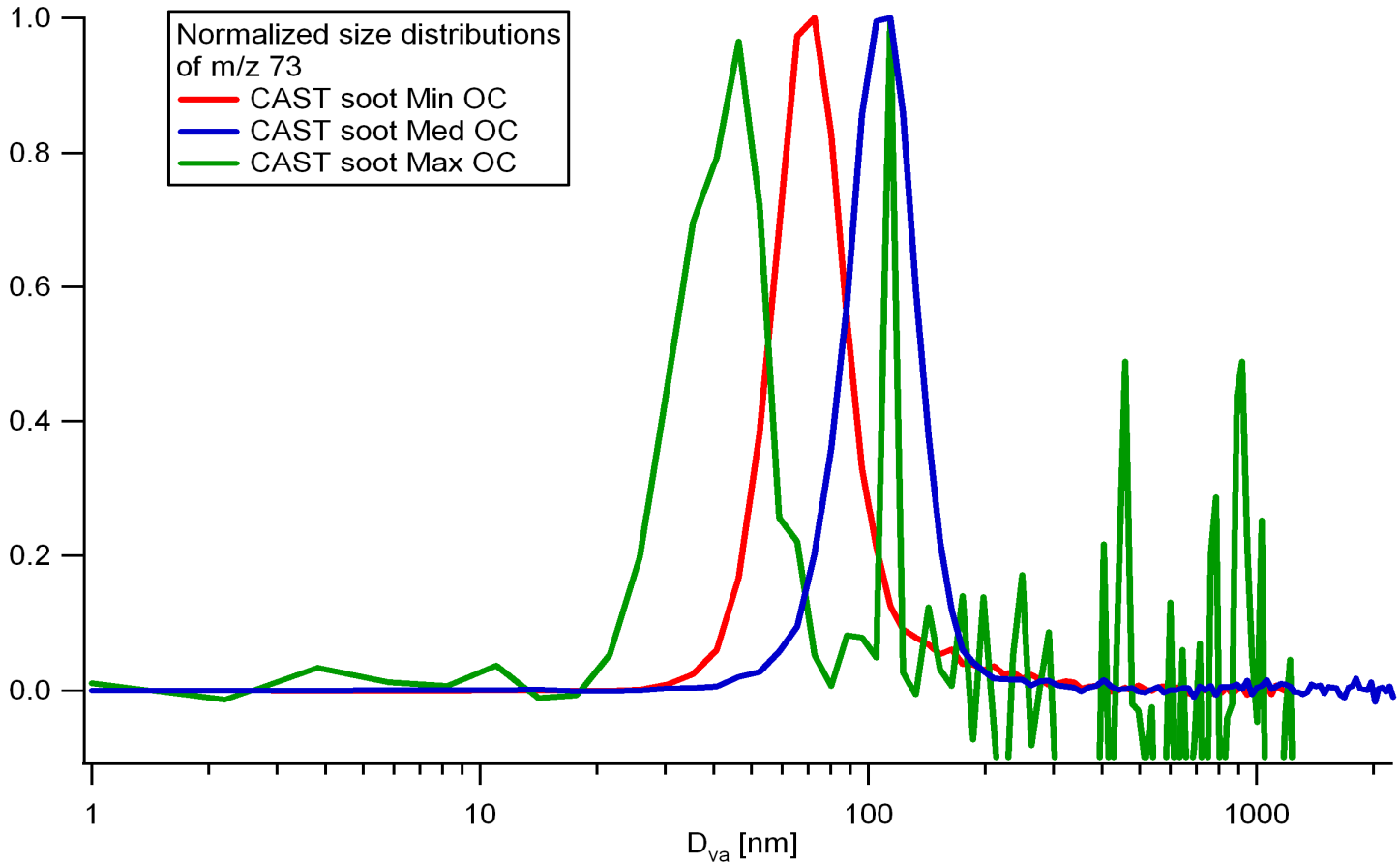
N_2 case: fraction of larger particles

Organic Fraction in Cast Soot



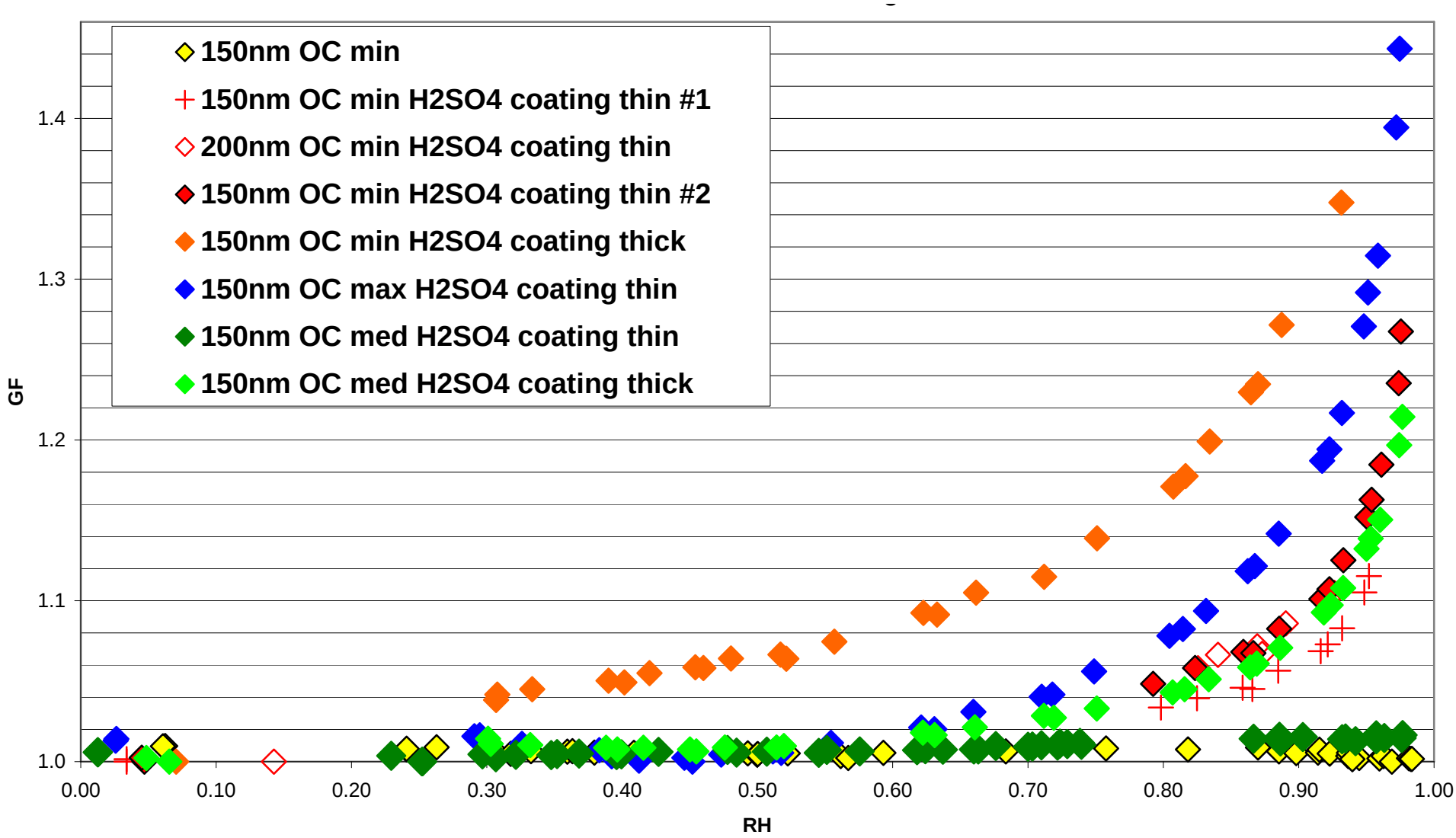
high molecular components increase with OC !

Organic Fraction in Cast Soot



soot with max OC smaller, because
of low absolute mass ?
of compaction ?

HTDMA: CAST soot / OC / H_2SO_4



Report on WP L4
Chemical Characterization of CCN and IN

Milestones WP L4

MS L4A Chemical characterisation of particles at AIDA (ICG-II, Uni-MZ, month 24) started

MS L4B Chemical characterisation of particles at LACIS (IfT, ICG-II, Uni-MZ, month 24) started

MS L4C Process understanding for in-situ coating of pre-existing CCN and IN assessed (ICG-II, month 30)
SAPHIR experiments: summer 2009

MS L4D Couple ZINC chamber to mass spectrometers (ETH, Uni-MZ, month 24)

Nothing due after first year => in time

Plan 2008 and 2009

June – July 2008 (EUCAARI):
HG, CCN activation of SOA in SAPHIR

August – September 2008 (EUCAARI):
HG, CCN activation of SOA of plant emissions in VEGATRON

Oktober 2008 (VI-ACI):
Carbonic Acids as IN and CCN in AIDA

Summer 2009 (VI-ACI):
HG, CCN and IN of coated particles, coatings of secondary nature in SAPHIR

Welcome to SAPHIR in Summer 2009

Formation and processing of CCN (and IN)

- **Natural light**
- **Low concentration levels**
- **Long time scales**

HTDMA Detailschema