
Detection and quantification of combustion-derived particles in aqueous media: towards the development of a diagnostic biomedical assay

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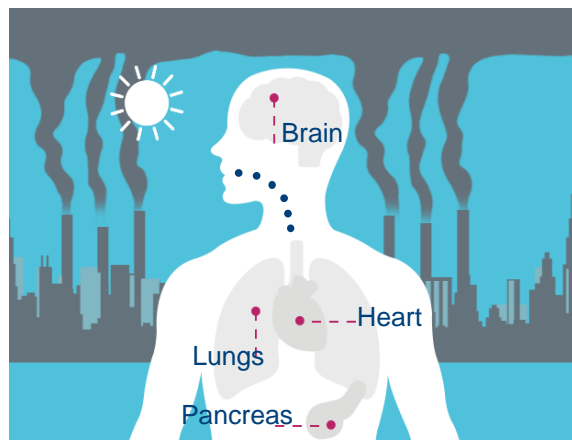
Ms. Eva Bongaerts



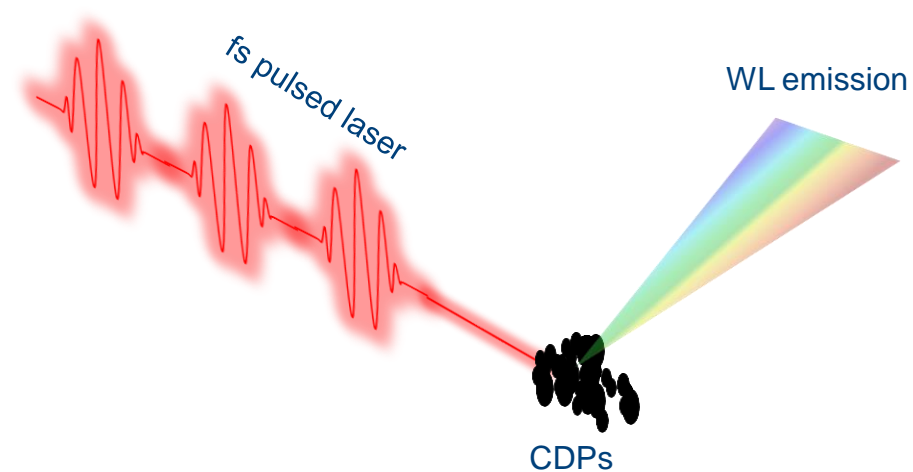
24th – ETH Conference on Combustion Generated Nanoparticles

Unique detection of combustion derived particles (CDPs)

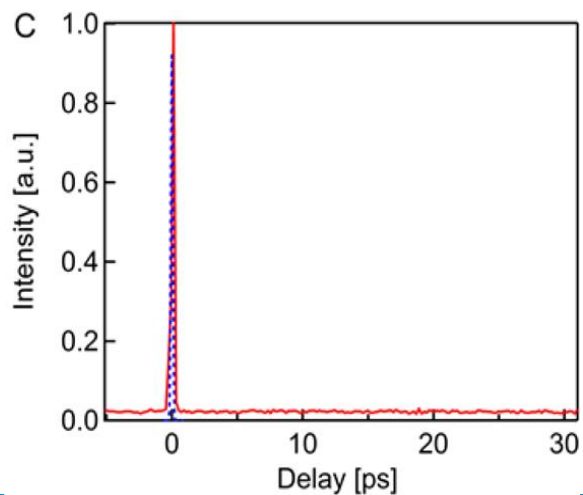
CDPs are hazardous



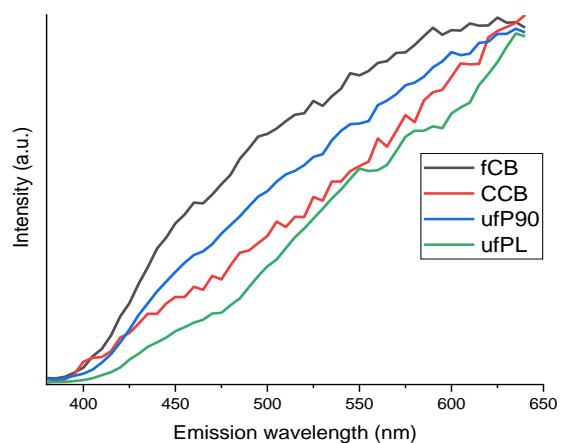
Unique label-free detection



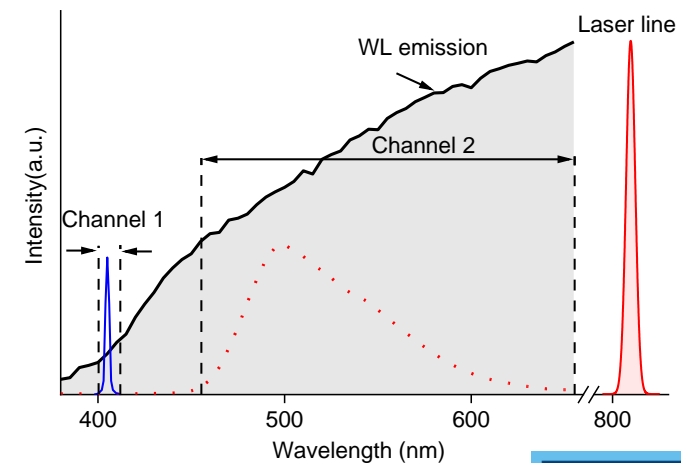
WL emission is instantaneous



WL emission covers the whole VIS spectrum

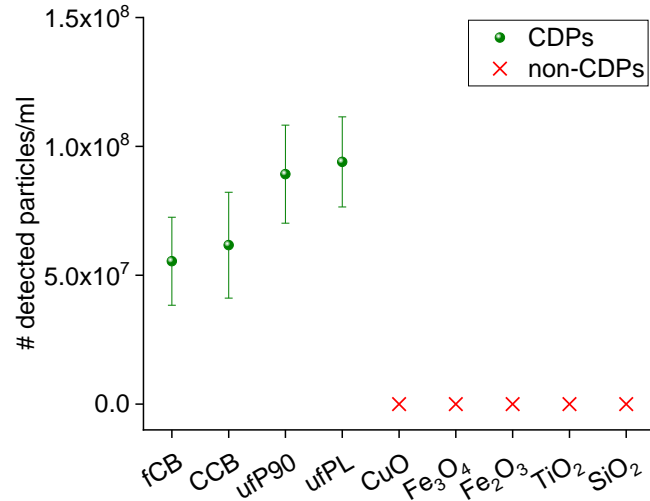


Detection using dual-channel

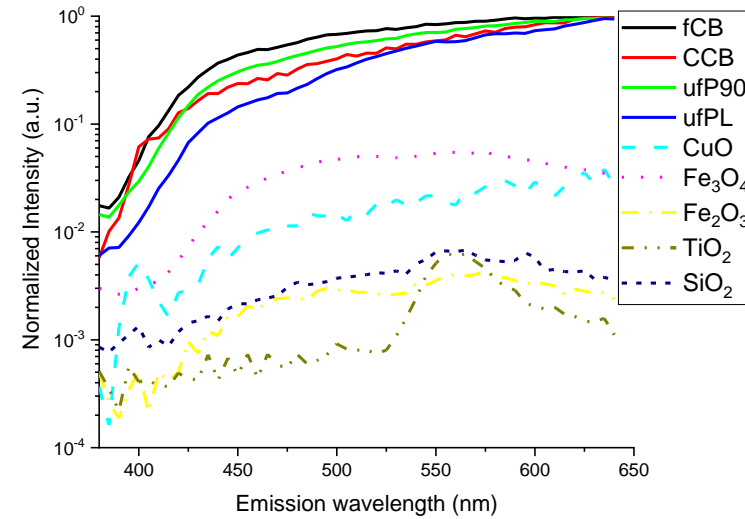


1. Bové H, Steuwe C, Fron E, et al. *Nano Lett.* **2016**, 16, 5, 3173–3178.
2. Saenen ND, Bové H, Steuwe C, et al. *Am J Respir Crit Care Med.* **2017**, 196,7.
3. Bové H, Bongaerts E, Slenders E, et al. *Nat Commun.* **2019**, 10, 3866.

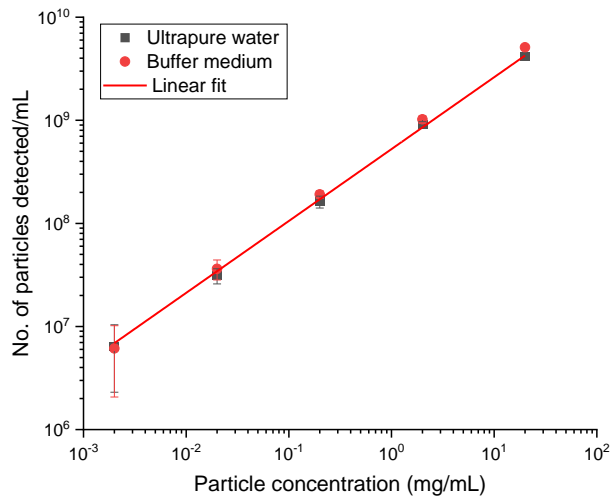
Nanoparticle detection in aqueous media



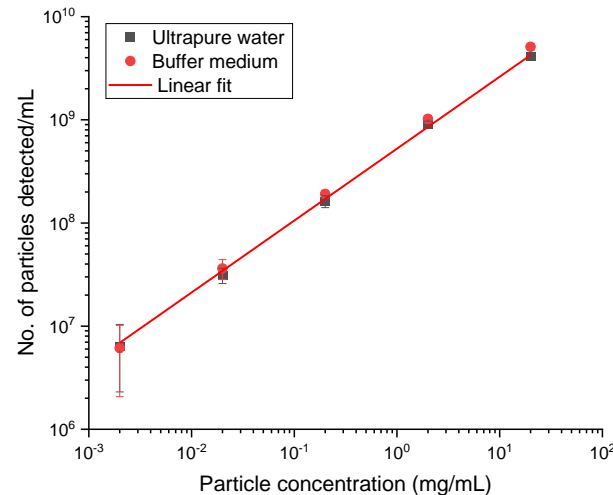
Emission spectra of CDPs and non-CDPs



Measurement without stirring the suspension



Measurement with stirring the suspension



Conclusions and outlook

- Label free detection of CDPs based on WL emission.
- Dual-channel detection and emission spectra measurements.
- WL emission is unique to CDPs only.
- Measurements in CDP suspensions at different concentrations.
- A step towards the development of diagnostic biomedical assays.

References:

- [1] Bové H, Steuwe C, Fron E, et al. *Nano Lett.* **2016**, 16, 5, 3173–3178.
- [2] Saenen ND, Bové H, Steuwe C, et al. *Am J Respir Crit Care Med.* **2017**, 196, 7.
- [3] Bové H, Bongaerts E, Slenders E, et al. *Nat Commun.* **2019**, 10, 3866.
- [4] Witters K, Plusquin M, Slenders E, et al. *Environ Pollut.* **2020**, 266, 1.
- [5] Aslam I, Roeffaers MBJ. Manuscript submitted for publication **2021**.