Physico-chemical characterization of fine and ultrafine particles emitted during DPF active regeneration of Euro5 Diesel vehicles

B. R'Mili[1,3], A. Boréave[1], A. Meme[1], P. Vernoux[1], M. Leblanc[2], L. Noël[2], S. Raux[2], B. D'Anna[1,3*]

[1]*Université Lyon 1, CNRS, UMR 5256, IRCELYON, Institut de recherches sur la catalyse et l'environnement de Lyon, 2 Avenue Albert Einstein, F-69626 Villeurbanne, France*
[2]*IFP Energies nouvelles - Direction Systèmes Moteurs et Véhicules, Etablissement de Lyon, Rond-point de l'échangeur de Solaize - Institut Carnot IFPEN Transports Energie- BP 3, 69360 Solaize – France*
[3] *now at the Aix-Marseille Univ, CNRS, LCE, 13003, Marseille, France*

*Corresponding Author : barbara.danna@univ-amu.fr

SI document

Number of pages: 5
Number of figures: 6
Number of tables: 1

List of Figures:

List of Tables:

Figure S1: Time evolution and pie charts of the particle chemical composition emitted during the second regeneration for the (a) FBC-DPF and (b) CDPF vehicle, respectively.

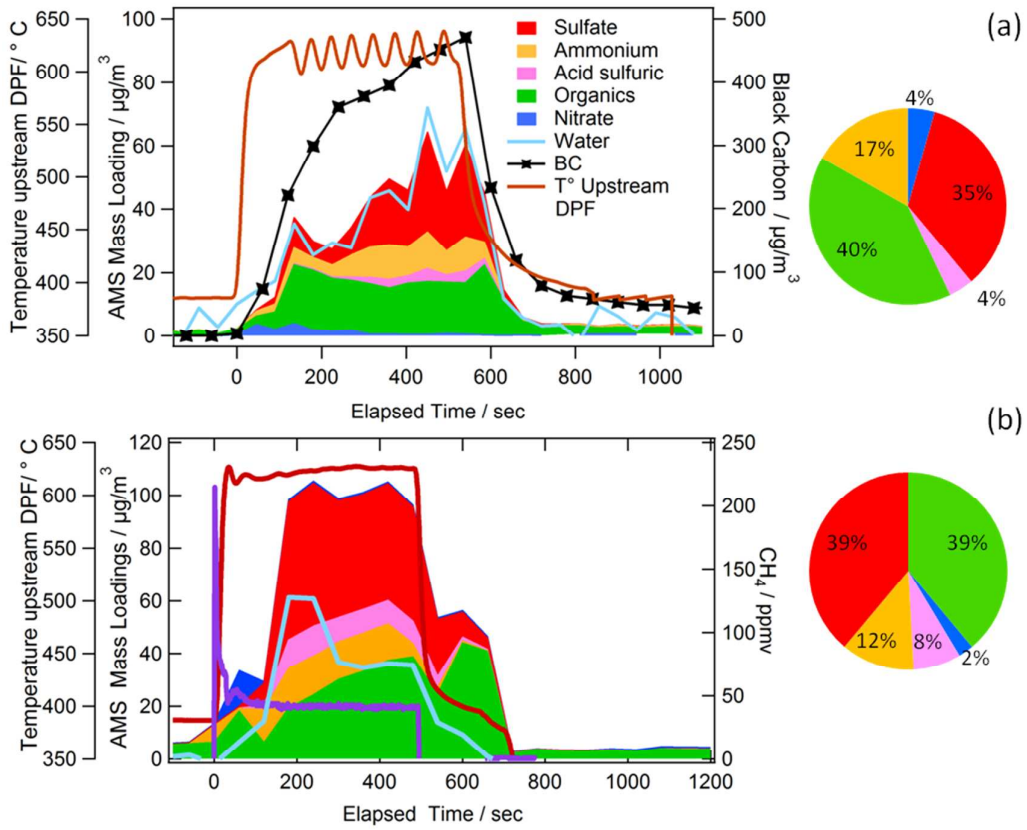

Figure S2: MAAP measurements : temporal evolution of black carbon (BC) mass emissions measured for three different regenerations of the FBC-DPF vehicle.

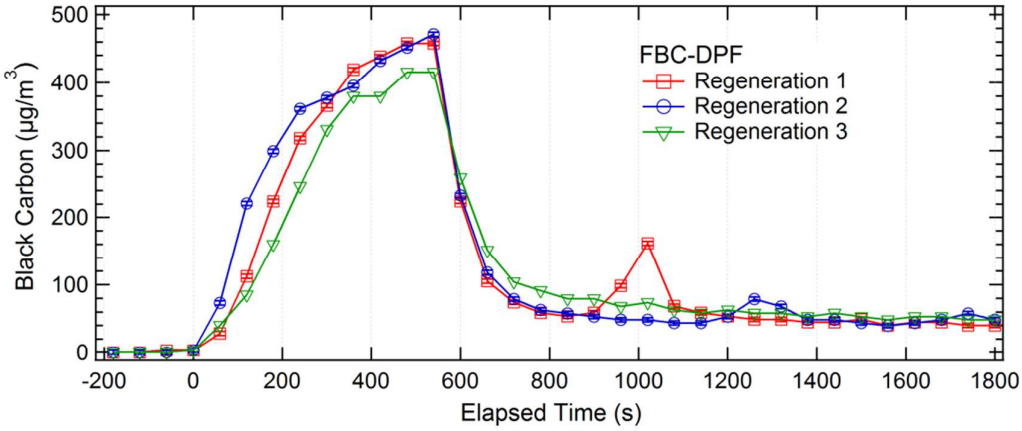

Figure S3: Average Mass Spectra of the semi-volatile fraction of particles emitted during the first regeneration of: (a) the Fuel Borne Catalyst (FBC-DPF) and (b) the catalyzed DPF (CDPF) vehicle, respectively.

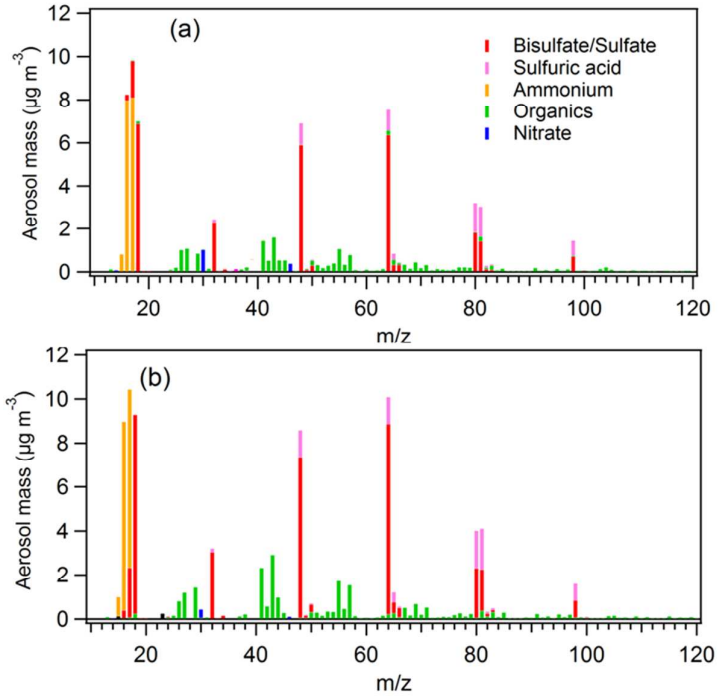

Figure S4: Average Mass Spectra of the organic fraction of particles emitted during regeneration of : (a) the Fuel Borne Catalyst (FBC-DPF) and (b) the catalyzed DPF (CDPF) vehicles.

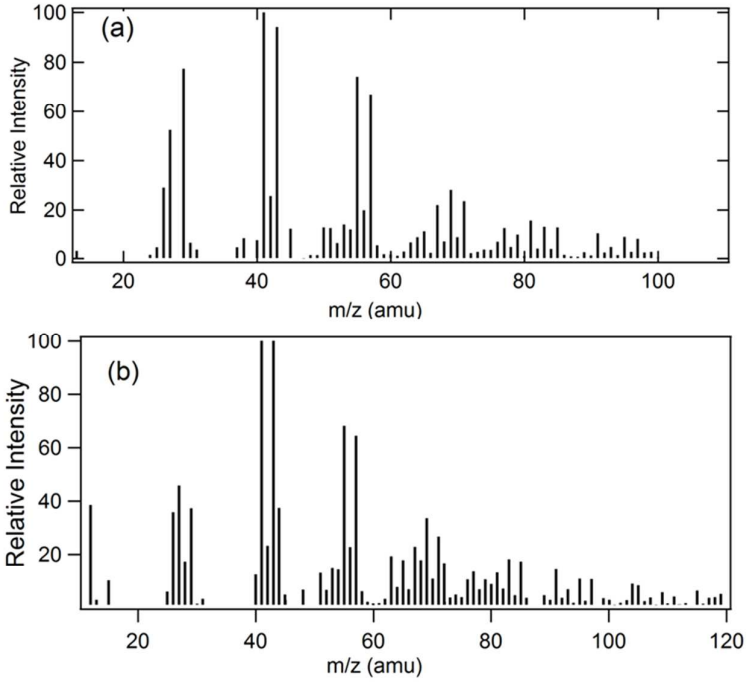

Figure S5: AMS Mass Spectra of the used lubricating oil for : (a) the Fuel Borne Catalyst (FBC-DPF) and (b) the catalyzed DPF (cDPF) vehicles.

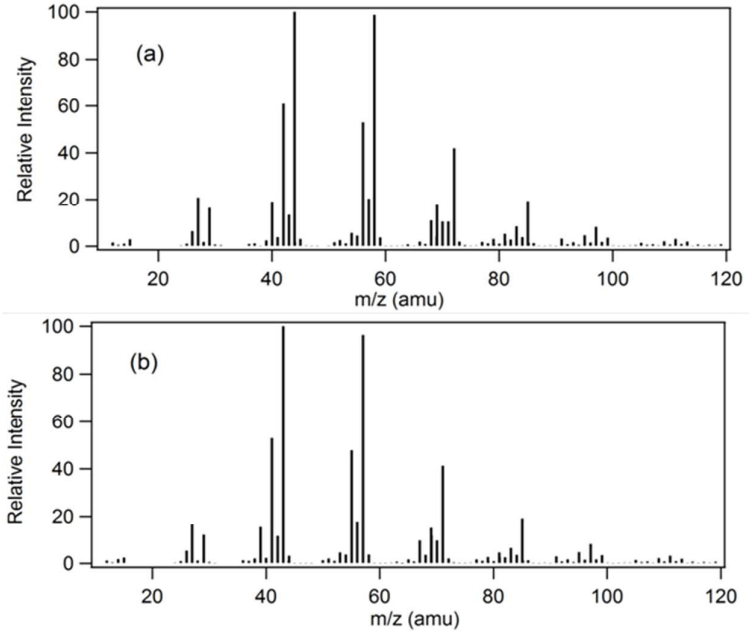

Figure S6: AMS Mass Spectra of the TAE fresh fuel used for both vehicles.

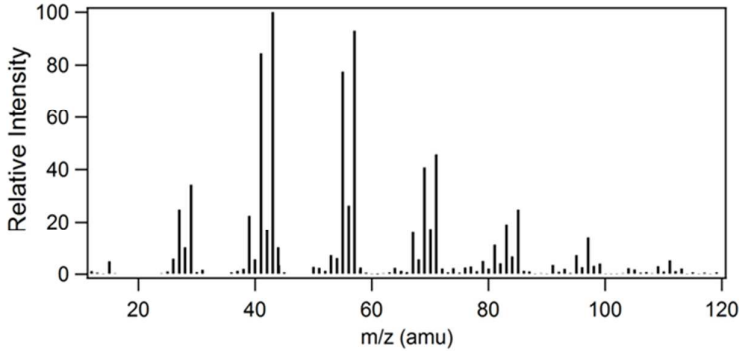

Table S1. Elemental Composition of the inorganic species found in used lubricant oil.

		Diesel FBC-DPF	**Diesel CDPF**
Sulfur	(wt %)	0.12	0.14
Calcium	(ppm)	1146	1061
Phosphor	(ppm)	438	383
Zinc	(ppm)	531	457
Iron	(ppm)	75	66
Si	(ppm)	15	11
Molybdenum	(ppm)	< 6	94
Copper	(ppm)	16	< 7

The following elements were found in low concentrations (below 7 ppm) : Ag, Ba, Bi, Cd, Co, Cr, Tl, Mg, Mn, Cr and Ni.