

EC/OC and PAHs Emissions from a Modern Diesel Engine Comprising DPF Regeneration Fueled with 10% RME Biodiesel

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Table S1. Target and qualifier ions of gas chromatography–mass spectrometry analysis conditions for polycyclic aromatic hydrocarbons.

Ion source temperature 230°C					
Ionization EI 70 eV					
Thermal desorption (T-DexII, GL sciences)					
Tube temperature 40°C→50°C/min→300°C (10 min)					
Split 20:20					
Cryo-focus					
Fused Silica Capillary Tube 0.3 m×0.53 mm i.d.×0.660 mm o.d.					
-50°C→50°C/s→300°C (10 min)					
Gas chromatograph (CP-3800, Bruker)					
Separation column;					
VF-5ms 0.25 mm i.d. × 30 m, Film thickness 0.25 mm					
Oven temperature					
60°C (3 min) →15°C/min→200°C→5°C/min→320°C (11 min)					
Mobile phase flow rate He, 1.0 mL/min					
Mass spectrometer (300MS, Bruker)					
Ion source temperature 230°C					
Ionization EI 70 eV					
Operating mode of MS					
		Target ion	Qualifier ion		Target ion
Number of rings	PAH (SRM 1647e)	<i>m/z</i>	<i>m/z</i>	PAH COCKTAIL FOR CARB METHOD 429	<i>m/z</i>
3	Phenanthrene	178	176	Phenanthrene- <i>d</i> 10	188
3	Anthracene	↑	↑	Anthracene- <i>d</i> 10	↑
4	Fluoranthene	202	101	Fluoranthene- <i>d</i> 10	212
4	Pyrene	↑	↑	Pyrene- <i>d</i> 10	↑
4	Benzo[<i>a</i>]anthracene	228	114	Benzo[<i>a</i>]anthracene- <i>d</i> 12	230
4	Chrysene	↑	↑	Chrysene- <i>d</i> 12	↑
5	Benzo[<i>b</i>]fluoranthene	252	126	Benzo[<i>b</i>]fluoranthene- <i>d</i> 12	264
5	Benzo[<i>k</i>]fluoranthene	↑	↑	Benzo[<i>k</i>]fluoranthene- <i>d</i> 12	↑
5	Benzo[<i>a</i>]pyrene	↑	↑	Benzo[<i>a</i>]pyrene- <i>d</i> 12	↑
5	Dibenz[<i>a,h</i>]anthracene	278	139	Dibenz[<i>a,h</i>]anthracene- <i>d</i> 14	292
6	Indeno[<i>1,2,3-cd</i>]pyrene	276	138	Indeno[<i>1,2,3-cd</i>]pyrene- <i>d</i> 1	288
6	Benzo[<i>ghi</i>]perylene	↑	↑	Benzo[<i>ghi</i>]perylene- <i>d</i> 12	↑

Table S2. Protocol for implementation of IMPROVE method for EC/OC analysis.
 EC: elemental carbon; OC: organic carbon

Protocol	IMPROVE protocol	
	Temperature (°C)	Atmosphere
OC1	120	He
OC2	240	↑
OC3	450	↑
OC4	550	↑
OCpy	550	2%O ₂ /He
EC1	550	↑
EC2	700	↑
EC3	800	↑
Detector	FID (150°C)	
Catalyst	Oxidation catalyst (900°C): MnO ₂ Methanation catalyst (420°C): Ni(NO ₃) ₂ ·6H ₂ O	
Gas flow	He-1: 40 mL/min He-2: 10 mL/min He-3: 50 mL/min 2%O ₂ /He: 10 mL/min H ₂ : 35 mL/min Air: 350 mL/min 5% CH ₄ /He: 10 mL (for calibration)	