Supplementary Material

Figures

**Fig. S1.** FTIR spectrum of P0 exhaust particles under low load.

**Fig. S2.** FTIR spectrum of P10 exhaust particles under low load.

**Fig. S3.** FTIR spectrum of P20 exhaust particles under low load.
Fig. S4. FTIR spectrum of P10 exhaust particles under high load.

Fig. S5. FTIR spectrum of P20 exhaust particles under high load.

Fig. S6. XPS survey scans of P0 exhaust particles under low load.
Fig. S7. XPS survey scans of P10 exhaust particles under low load.

Fig. S8. XPS survey scans of P20 exhaust particles under low load.

Fig. S9. XPS survey scans of P10 exhaust particles under high load.
Fig. S10. XPS survey scans of P20 exhaust particles under high load.

Fig. S11. Narrow scans of P0 exhaust particles element C under low load.

Fig. S12. Narrow scans of P10 exhaust particles element C under low load.
Fig. S13. Narrow scans of P20 exhaust particles element C under low load.

Fig. S14. Narrow scans of P10 exhaust particles element C under high load.

Fig. S15. Narrow scans of P20 exhaust particles element C under high load.