

### Electronic Supplementary Information

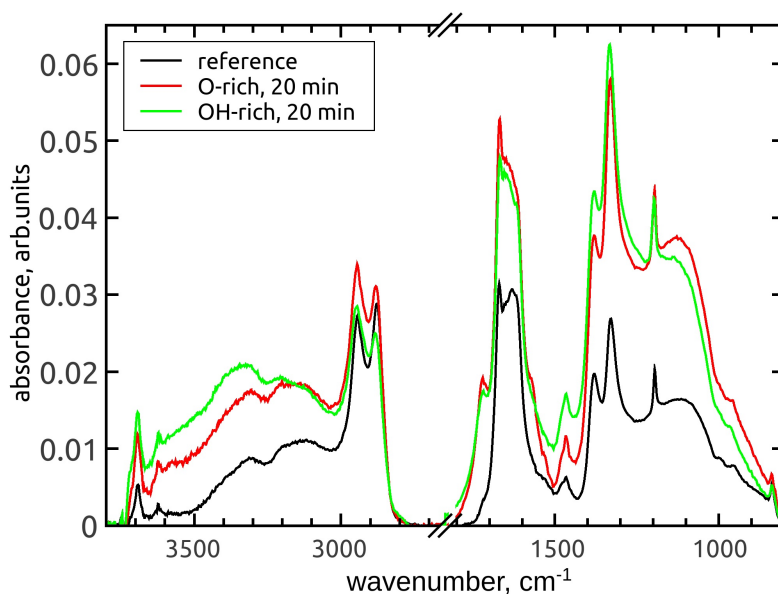


Fig. S1: FTIR spectra of short-dried reference (black) and 20 min AOR treated (red, green) H-DNDs. The “O-rich” conditions correspond to dry helium, while under “OH-rich” conditions helium was humidified with 4000 ppm of water vapour in order to switch from O atoms formation to OH radicals formation.

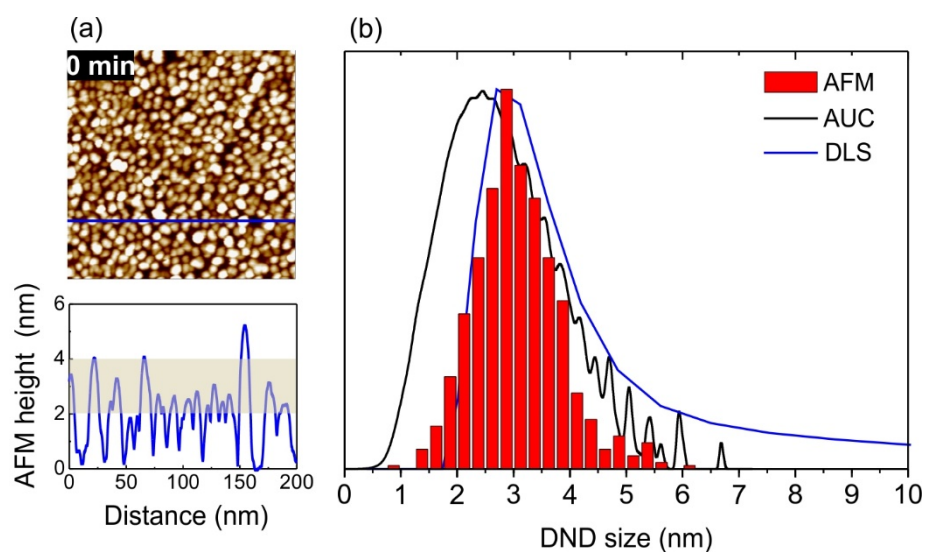


Fig. S2: The DLS volumetric mean size of 2.7 nm reasonably correlates with the AUC size distribution as well as with AFM investigation of the H-DNDs deposited on Si substrate. The mean size dispersion provided by the three techniques is within only 0.5 nm. Fig. S2 shows AFM image of untreated H-DNDs deposited on Si/SiO<sub>x</sub> substrate. The untreated H-DNDs preferentially form a monolayer-like deposit of mostly isolated single DND particles which is accompanied by very low RMS value of 1.0 nm and very high nucleation density, estimated from the AFM image to be  $\approx 2 \cdot 10^{12} \text{ cm}^{-2}$ . The AFM image and an AFM height profile clearly demonstrate that size of most of the particles is within 2-4 nm.

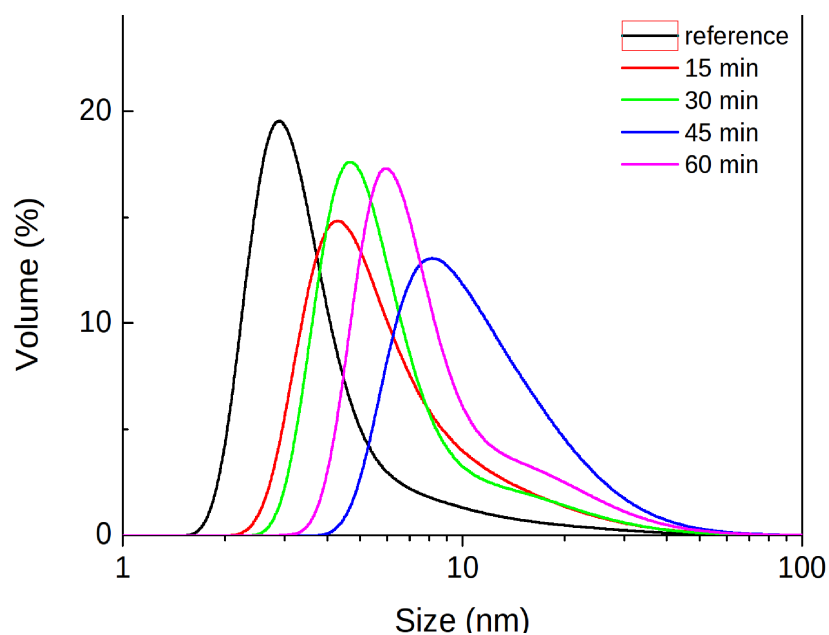


Fig. S3. Volumetric distribution of particle size (DLS) after various AOR treatment times.

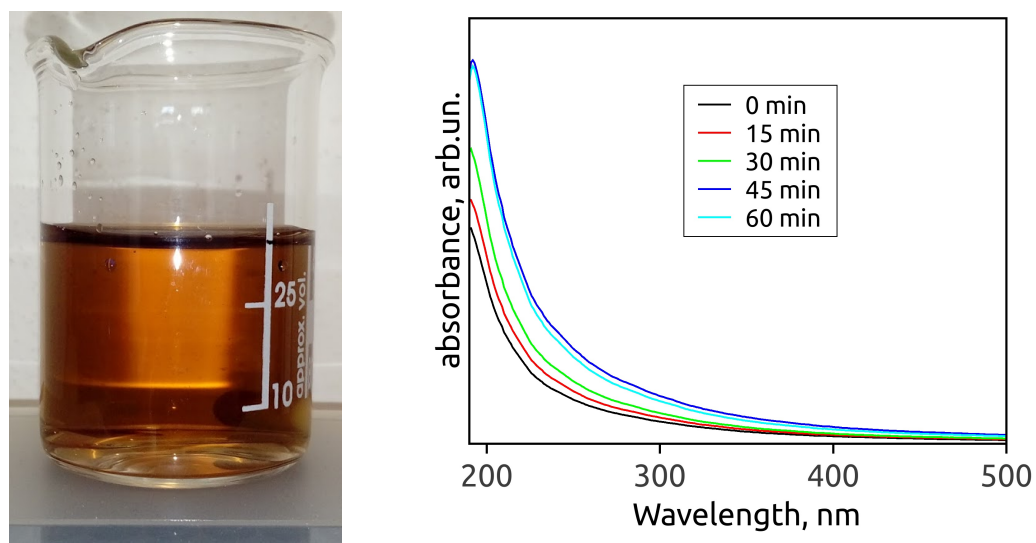


Fig. S4. Suspension of H-DND particles (photo and UV absorption spectra of the suspensions). The colour remain the same after AOR and transparency very little decreased. Both untreated and treated suspension were stable for months.

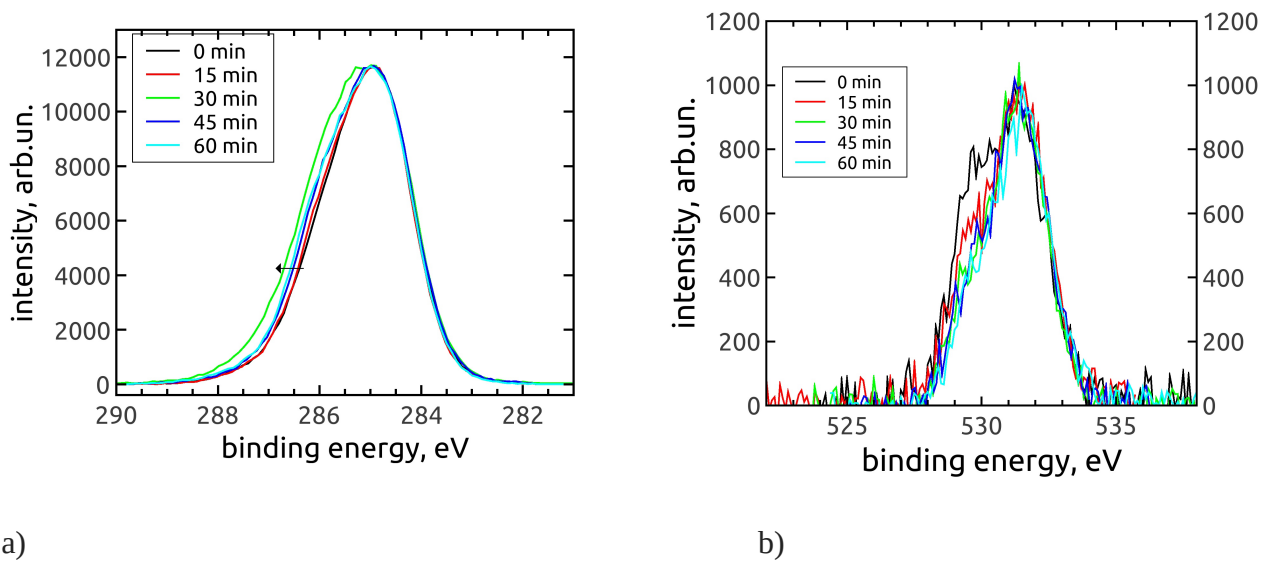


Fig. S5. High-resolution XPS spectra of C1s (a) and O1s (b) band.

Table T1. Final pH of the treated suspension. Initial pH of pure DI water was 5.7.

AOR time	pH
0 min	7.20
15 min	7.69
30 min	7.75
45 min	7.88
60 min	7.6

Note: The pH change during the treatment may be associated with dissolving of ROS in water or binding or releasing  $H^+$  by different surface functional groups on DNDs. Both acidic (COOH) and basic (Lewis-bases – ketons) groups are formed by our plasma treatment with the unknown proportion each other and also to other possible acido-basic groups whose surface concentration is unknown.