Electronic Supplementary Information

Tailoring the stoichiometry of graphitic C_3N_4 nanosheets under electron beam irradiation

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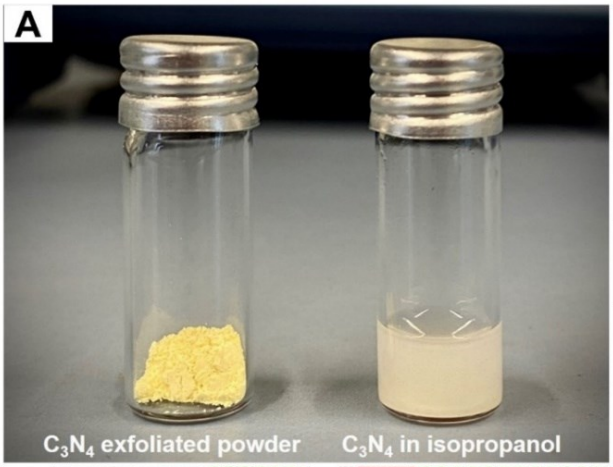

Sonication time [minutes]	Solvent	Concentration [µg/ml]
3	Isopropanol	40
10		
15		
30		

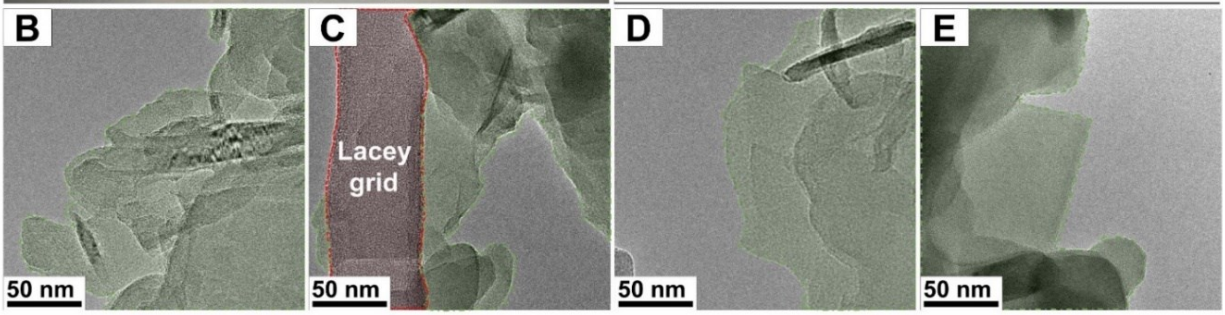

Figure S-1 (A) Vials containing C_3N_4 powder on the left and a small amount of C_3N_4 powder bath sonicated and dispersed in isopropanol on the right. After the sonication, the solution containing the dispersed flakes were left resting for 600 s to promote the precipitation of large agglomerations. Only the supernatant was used to drop coat the TEM grid. The table summarizes the parameters used to prepare the TEM sample. The various sonication times to disperse and exfoliate the C_3N_4 flakes are shown in panels (B)-(E). The C_3N_4 flakes are shaded in green. Panel C shows shaded in red an amorphous carbon Lacey film supporting the C_3N_4 flakes. No differences in the exfoliation efficiency between the shortest and longest sonication times were observed. To minimize defects short sonication times were used.

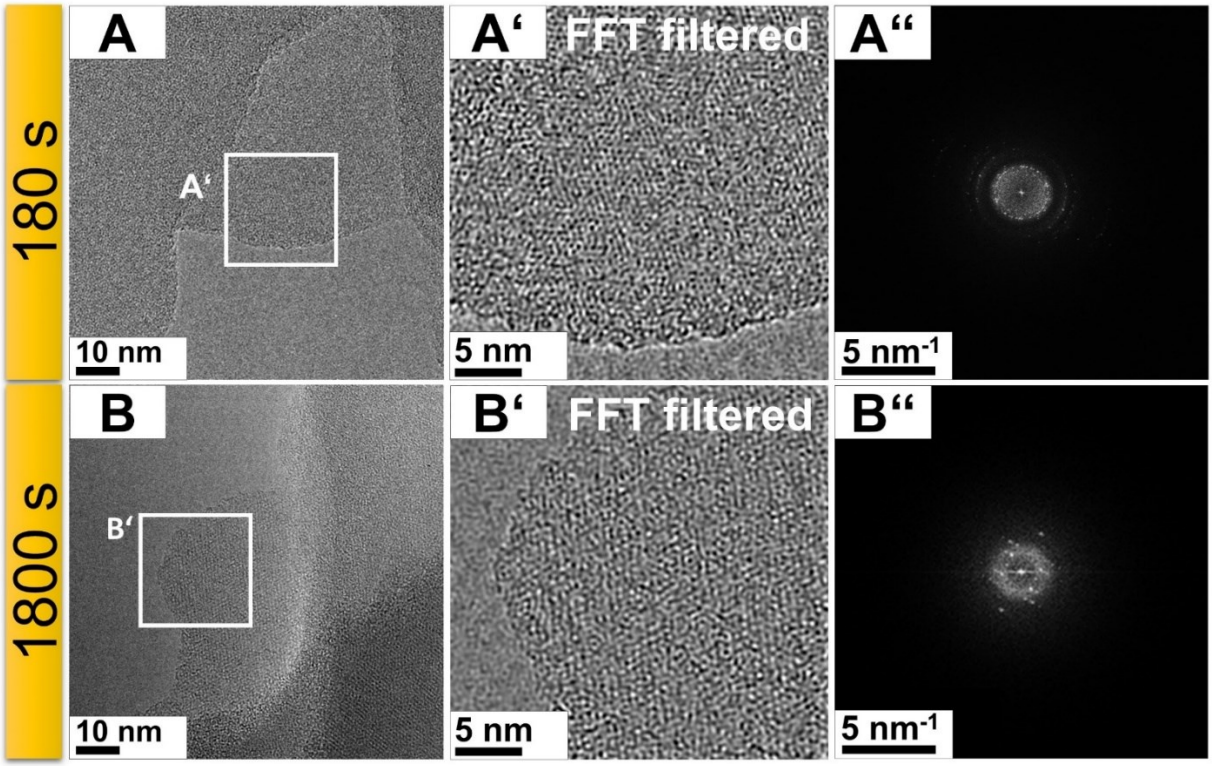

Figure S-2 (A)-(A'') C_3N_4 powder bath sonicated for 180 s in isopropanol and imaged at 300 kV. The flakes are crystalline and it is possible to acquire high-resolution images with low current densities to minimize electron beam irradiation damage. Applying an FFT filter makes it easier to observe the lattice, as seen in A'. Panel A'' shows the FFT of the initial image A. (B) to (B") C_3N_4 powder sample bath-sonicated for 1800 s to check if the exfoliation of the C_3N_4 layers is better. The images above show that there is no noticeable difference between sonication times.

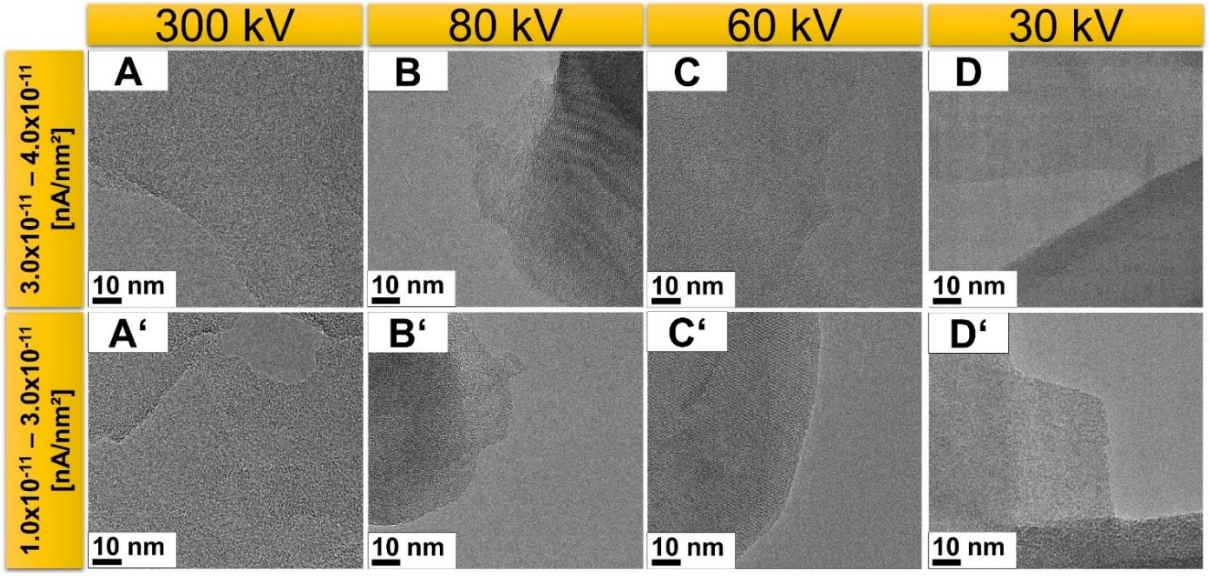

Figure S-3 Comparison of the degradation time with respect to the microscope acceleration voltage and the electron current density. (A) and (A') suggest that using an acceleration voltage of 300 kV the degradation of the C_3N_4 lattice happens at a fast rate for current densities above $4.0x10^{-11}$ nA/nm². The same case is for acceleration voltage of 80 kV shown in panels (B) and (B'). For 60 kV rapid degradation of the lattice occurs for current densities above $3.0x10^{-11}$ nA/nm² shown in panels (C) and (C'). For 30 kV the degradation of the lattice occurs at lower current densities, typically above $2.0x10^{-11}$ nA/nm² as shown in panels (D) and (D').