Electronic Supplementary Material (ESI) for Nanoscale

Electronic Supplementary Information

Unidirectional self assembly of soft templated mesoporous carbons by zone annealing

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Figure S1 illustrates the similarity in patterns for the FDU-15-F127-ZA at ϕ=0° and ϕ=90°. The scattering intensity is greater at ϕ=0°, so there is some orientation preference to the direction of zone annealing in this case. However, the differences are small, which strongly suggests a very weakly orientation for this sample.

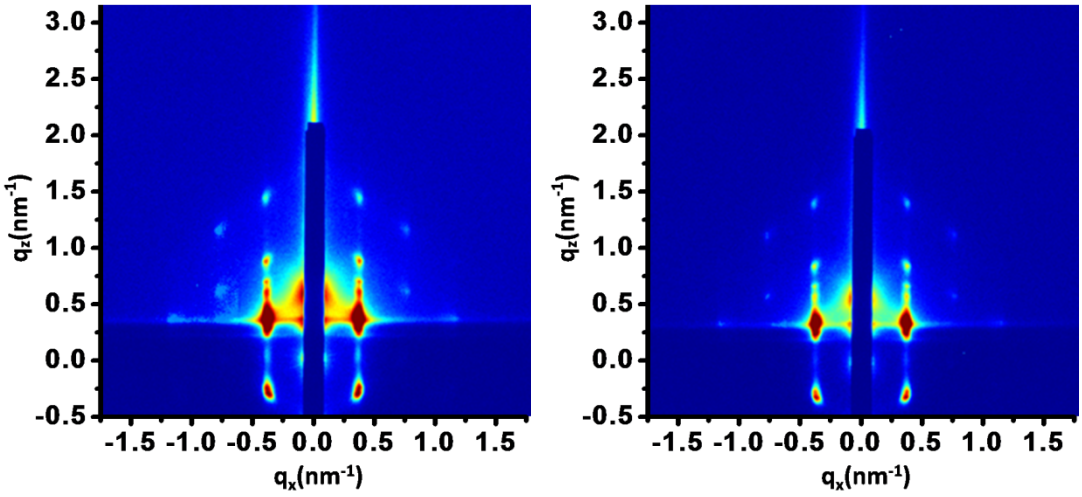
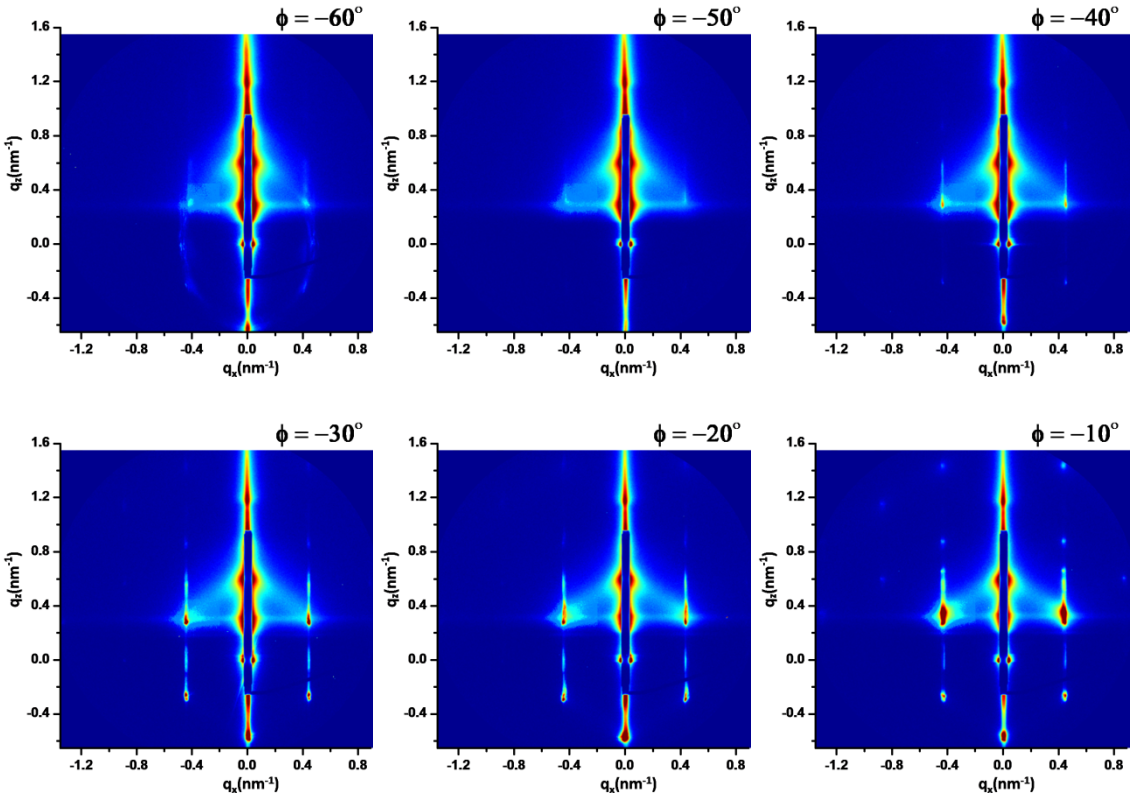


Figure S1. 2D GISASXS patterns at each angle for FDU-15-F127-ZA (0° left, 90° right)

In order to quantify the orientation of the mesostructure, rotational GISAXS is applied where by 2D scattering patterns are obtained at different sample orientations by rotating the film. Figure S2 illustrates the rotation GISAXS profiles for FDU-15-P123-150-ZA with 10° steps. Intense primary diffraction peaks and higher order peaks are sharp and clearly visible at 0° (primary orientation direction). As the sample is rotated away from this aligned direction, the scattering intensity decreases. At ± 20°, several higher order peaks are no longer visible; by ± 40°, the primary diffraction peak is weak and higher order reflections are not clearly evident in the scattering patterns.



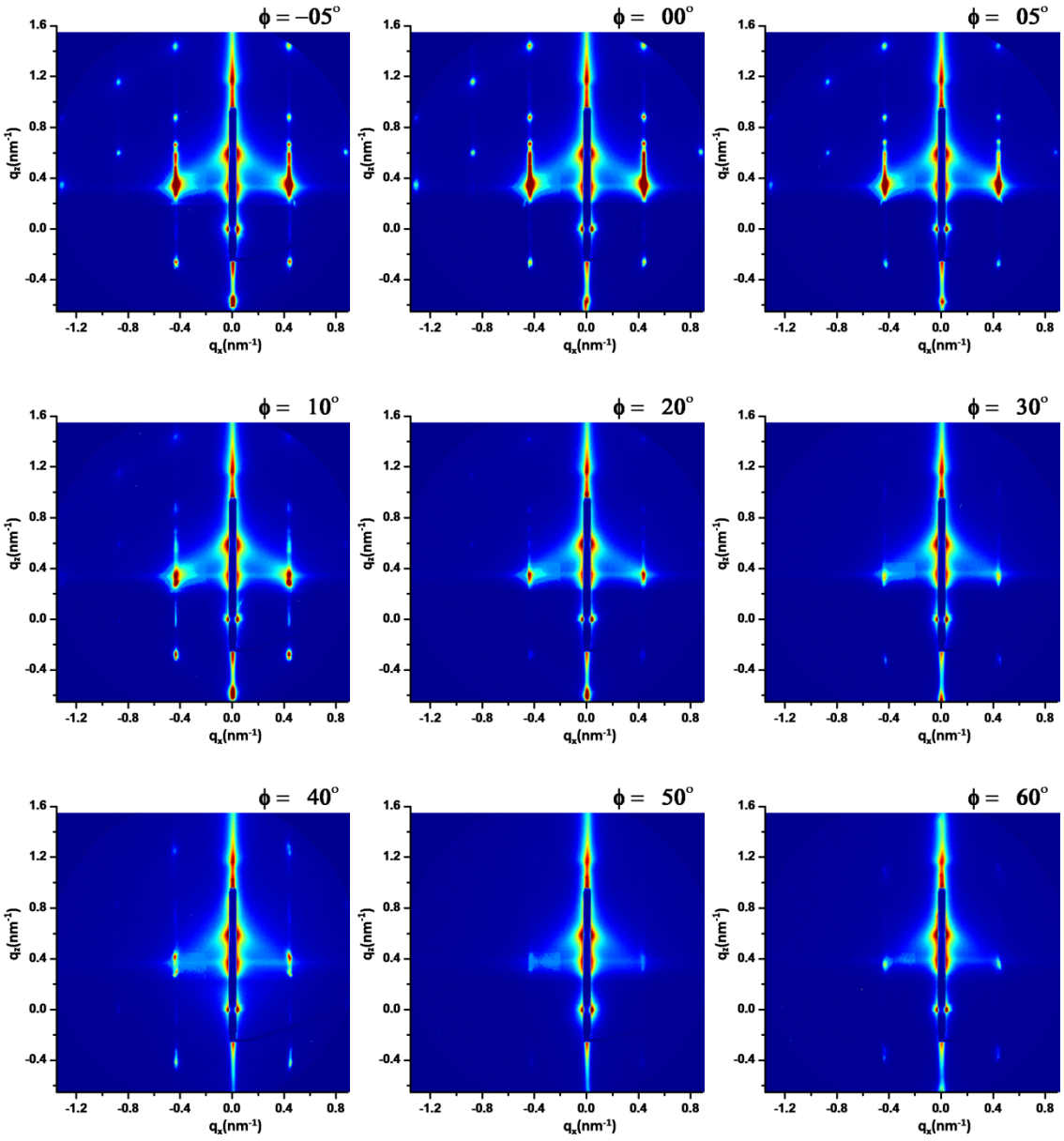


Figure S2. Rotational GISASXS patterns at each angle for FDU-15-P123-150-ZA

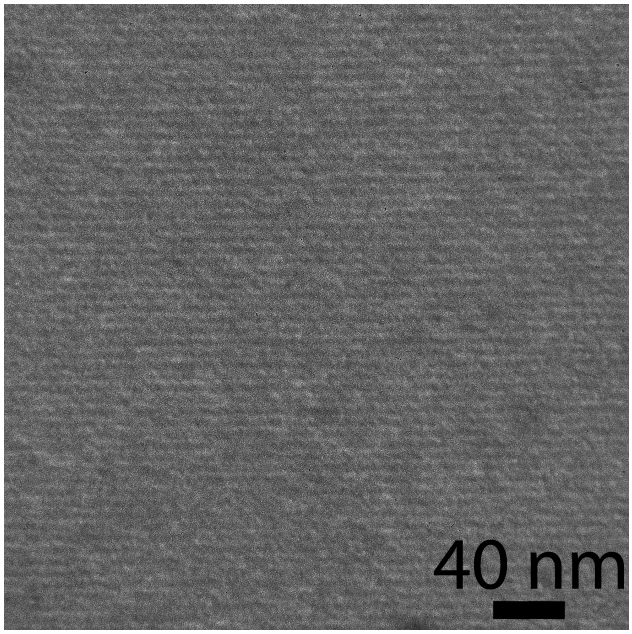


Figure S3. TEM micrograph of FDU-15-P123 after carbonization looking through the film thickness.

Figure S3 illustrates a TEM micrograph of FDU-15-P123 after carbonization. The film has been removed from the quartz substrate by immersion in aqueous NaOH solution. The floating film was then collected on a copper grid for TEM analysis. In this small local micrograph, all of the cylindrical domains are unidirectionally aligned (horizontal) despite not exposing this film to the zone annealing process. As *S* from the TEM micrograph is nearly unity, while from GISAXS S ≈ 0, the use of local metrologies can lead to incorrect assumptions regarding the global orientation of these mesostructured films.