(Supporting Information)

Structural Insights into Semicrystalline States of Electrospun Nanofibers: a Multiscale Analytical Approach

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Ruland method to determine the degree of orientation of nanofibers:

Ruland method was applied to the SAXS profiles nanofibers membrane samples aligned at 1000 rpm, 1500 rpm and 2000 rpm rotating drum speed and corresponding misorientation width was calculated. The values of calculated misorientation width are listed in the table (1) of main manuscript.

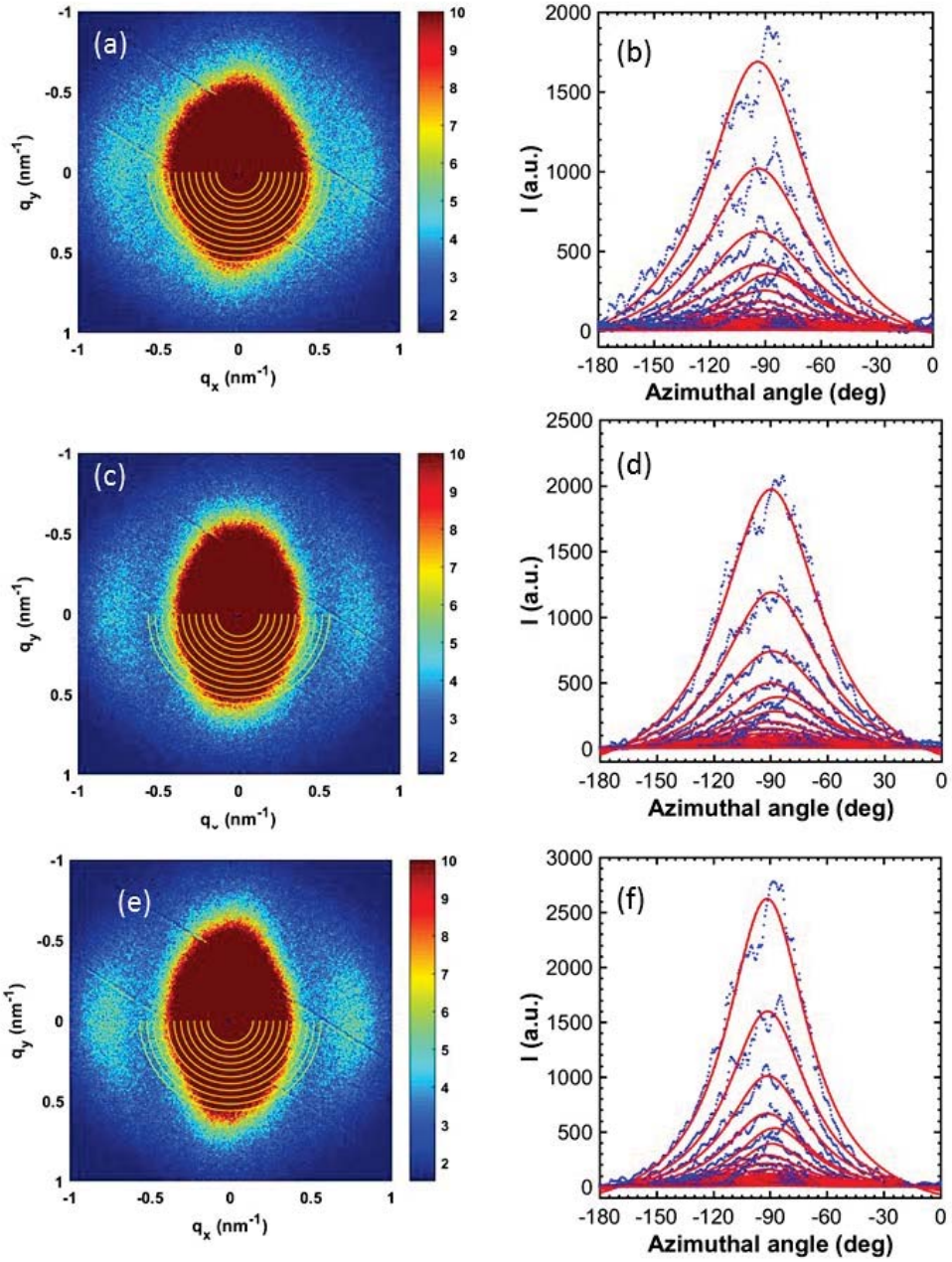

Figure (1). (a) (c) and (e) are the zoomed in part the 2D SAXS profile which are indicating the streak like single and azimuthal profile indicated by yellow line at different q for aligned samples at 1000 rpm, 1500 rpm and 2000 rpm respectively.(b), (d) and (f) are their corresponding azimuthal scans and Lorentzian fits.

Atomic Force Microscopy (AFM)

Below is the vertical and horizontal line scans in the selected area with respect to nanofiber axis. Average roughness was calculated by taking the average of all scans for both directions according to the following equation

$$R_a = \frac{1}{n}\sum_{i=1}^{n}|z_i| \tag{S1}$$

where n is the number of points in the profile, and z_i is the height value at point i obtained from filtered hright images. The values reported in the main manuscript are the average over 10 scans.

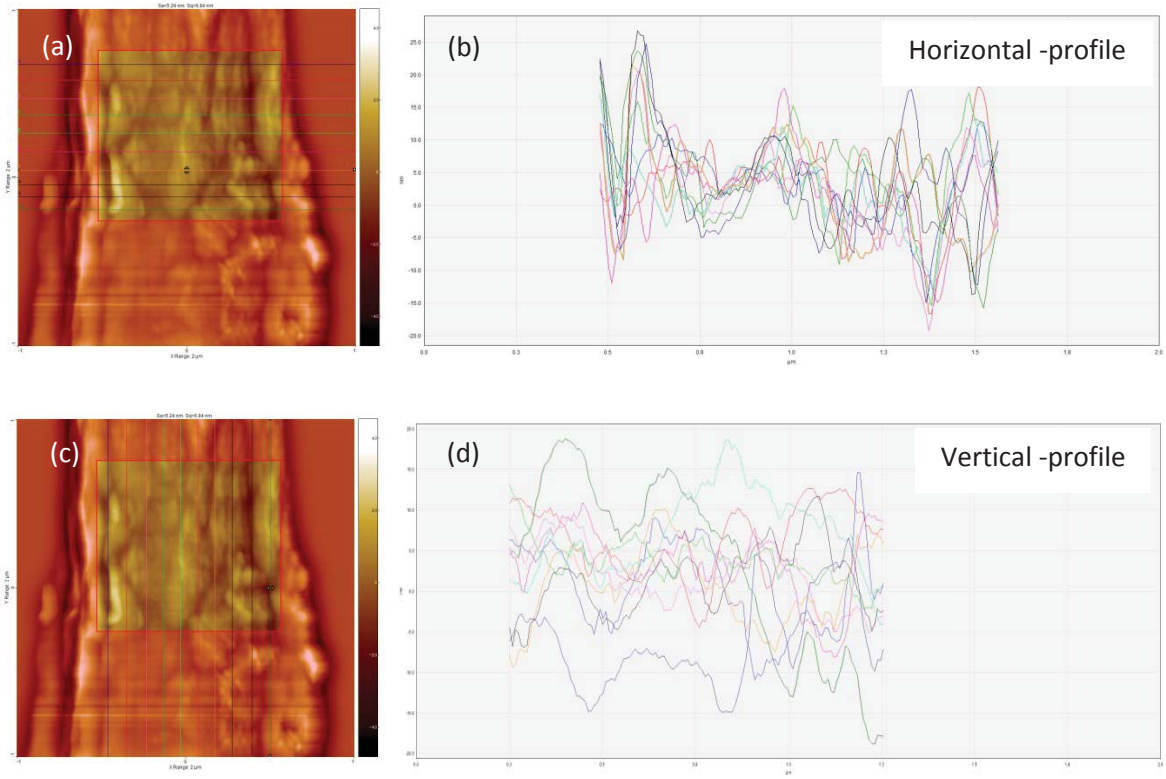

Figure (2). (a) and (c) AFM height images indicating the lines where 1D profile was extracted in horizontal and vertical directions respectively. (b) and (d) are their corresponding 1D profiles.