Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supplementary Information

Enhanced dielectric performance of polyvinylidene fluoride composites with all-carbon hybrid architecture: vertically aligned carbon nanotube arrays on graphite nanoplatelets

Hang Zhao[1], Min-Hao Yang, Delong He and Jinbo Bai[1,]**

[1] Laboratoire de Mécanique des Sols, Structures et Matériaux, Ecole Centrale Paris, CNRS UMR 8579, PRES UniverSud, Grande Voie des Vignes, 92290 Châtenay-Malabry Cedex, France.

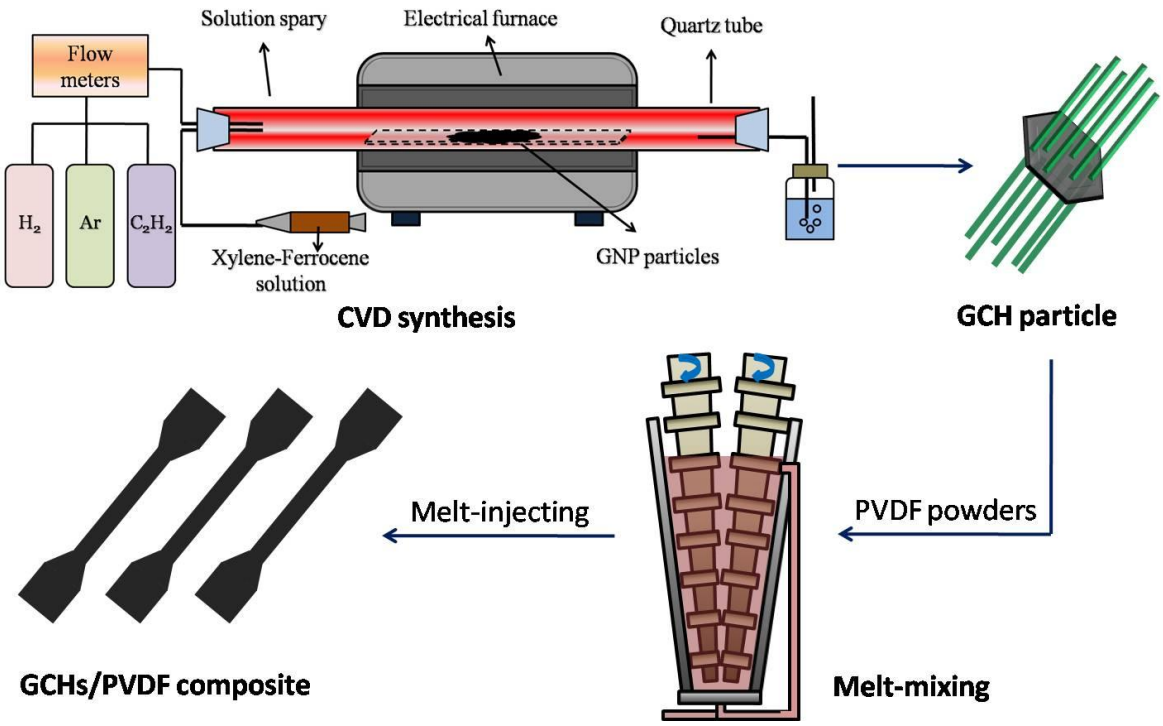


Fig. S1 The Schematic Illustration of the Preparation of GCH Particles and GCHs/PVDF Composites.

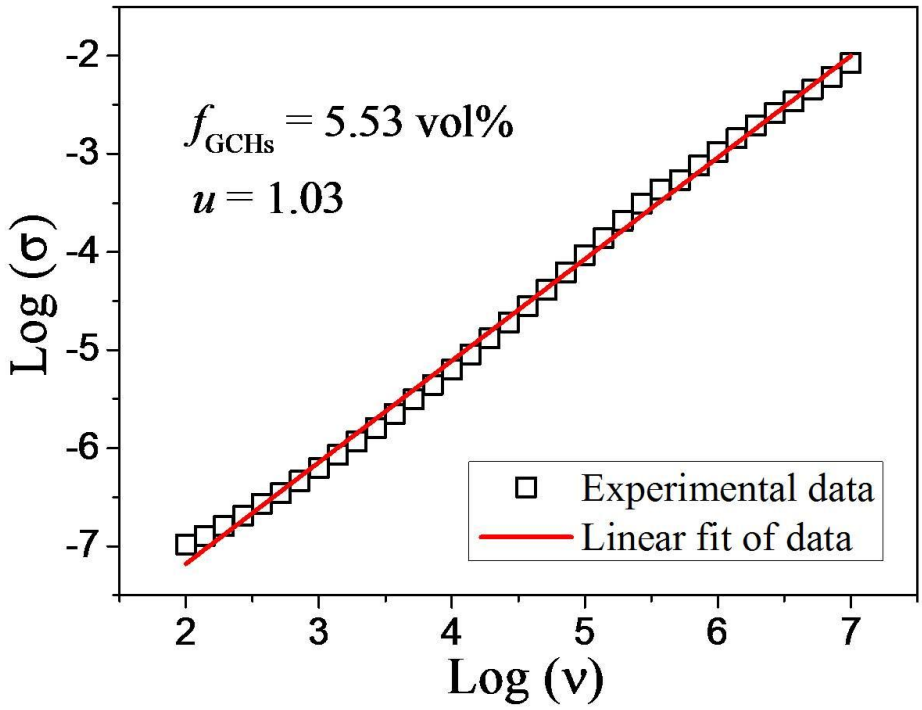


Fig. S2 The linear fitting to experimental AC conductivity according to Eqution.4

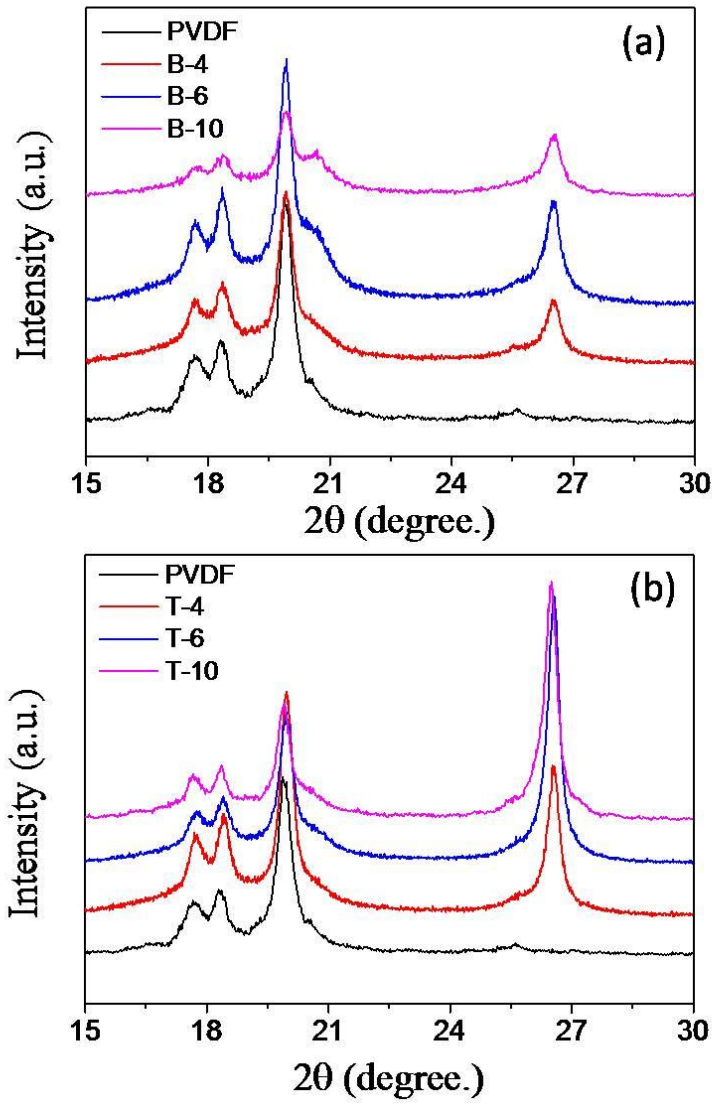
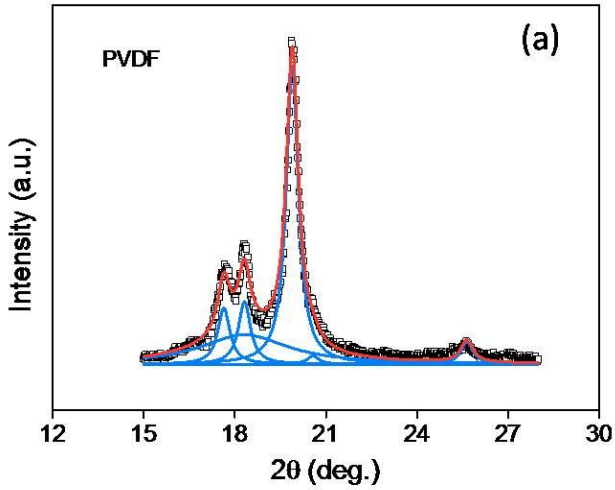
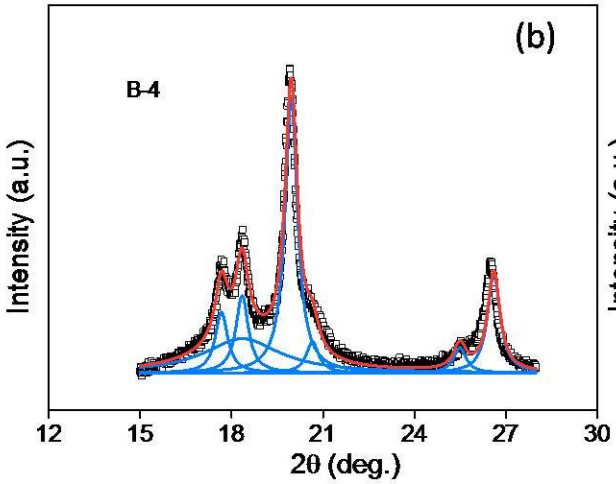
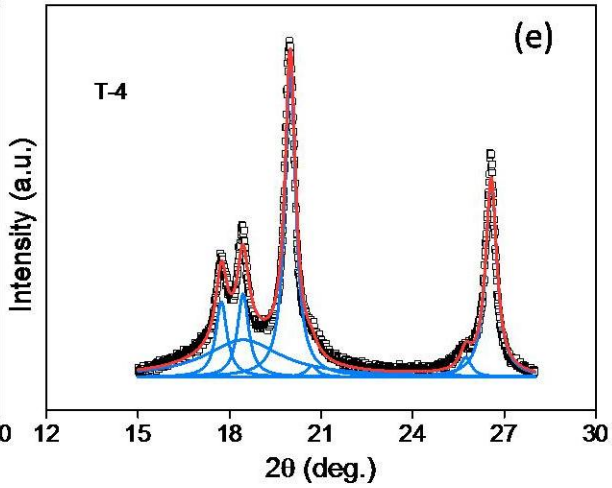
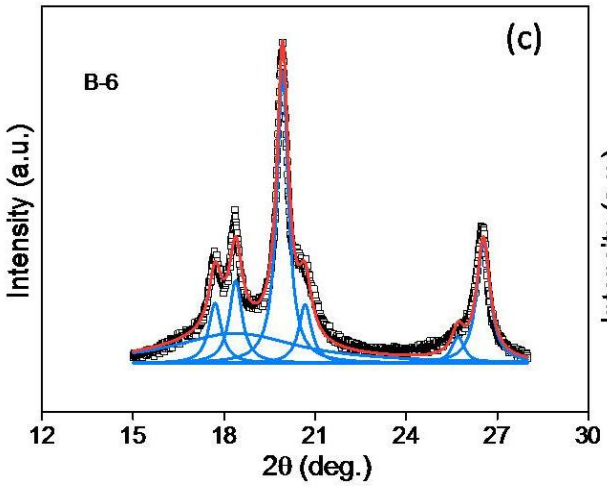


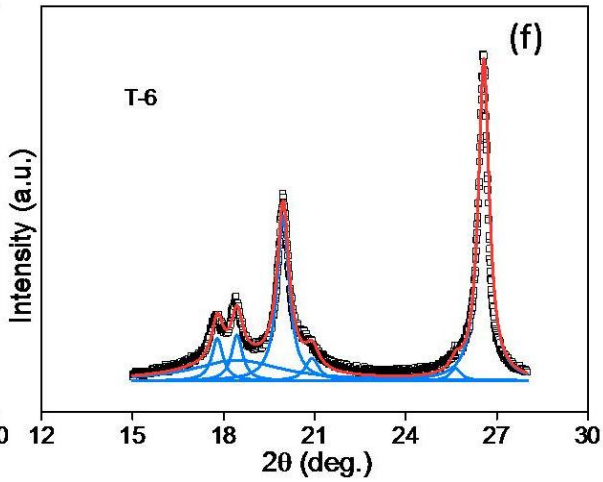
Fig. S3 X-ray diffraction patterns of pure PVDF polymer and (a) GCHs/PVDF binary composite: B-4, B-6, and B-10 and (b) GNPs/CNTs/PVDF ternary composite:T-4, T-6 and T-10.


(a)
PVDF
Intensity (a.u.)
12
15
18
21
24
27
30
2θ (deg.)


(b)
B-4
Intensity (a.u.)
12
15
18
21
24
27
30
2θ (deg.)


(e)
T-4
Intensity (a.u.)
12
15
18
21
24
27
30
2θ (deg.)


(c)
B-6
Intensity (a.u.)
12
15
18
21
24
27
30
2θ (deg.)


(f)
T-6
Intensity (a.u.)
12
15
18
21
24
27
30
2θ (deg.)

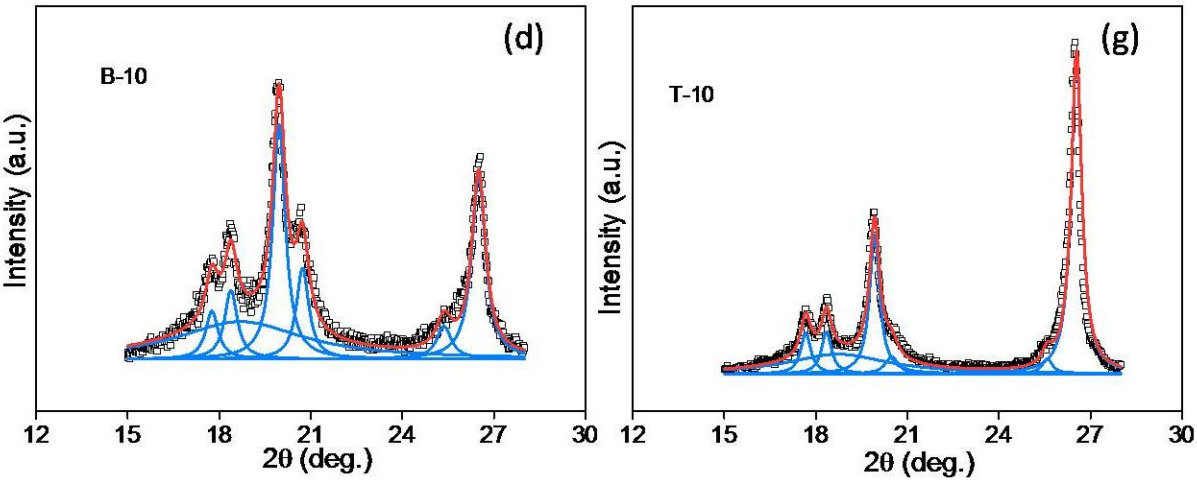


Fig. S4 Origin's multiple peak separation fitting results of (a) PVDF; GCHs/PVDF binary composite: (b) B-4, (c) B-6, (d) B-10 and GNPs/CNTs/PVDF ternary composite: (e) T-4, (f) T-6 and (g) T-10.

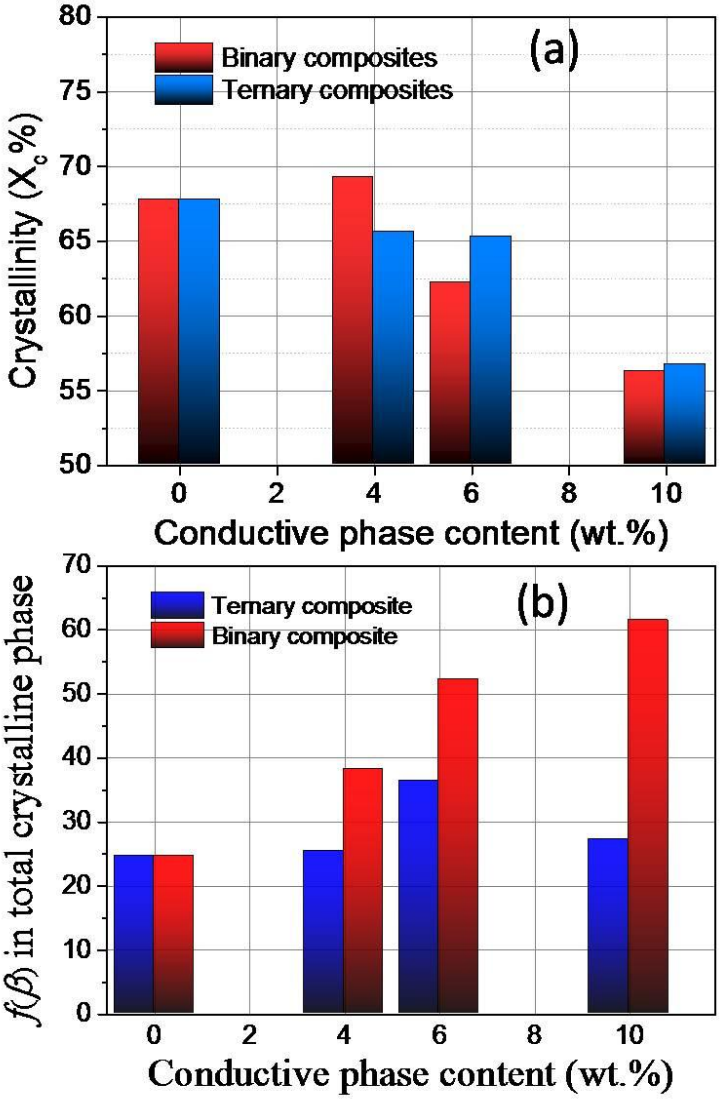


Fig. S5 Calculated (a) crystallinity (*Xc%*) and (*β*) relative b-phase fraction in crystalline (*f (β)*) of pure PVDF polymer, GCHs/PVDF binary composite: B-4, B-6, and B-10 and GNPs/CNTs/PVDF ternary composite:T-4, T-6 and T-10.