

Electronic Supplementary Information (ESI)

Direct Electrospinning Construction of Nanocables with Electrical Conductive-Magnetic Core and Insulative- Photoluminescent Sheath

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Morphologies of Fe₃O₄ nanoparticles

As seen in Fig. S1a, the obtained Fe₃O₄ nanoparticles before coating oleic acid are spherical in shape, and the particle size is *ca.* 10 nm. After being coated with oleic acid, as indicated in Fig. S1b, the morphology of Fe₃O₄ nanoparticles barely changes, and the blurry coating layers can be observed outside the surface of each Fe₃O₄ nanoparticle.

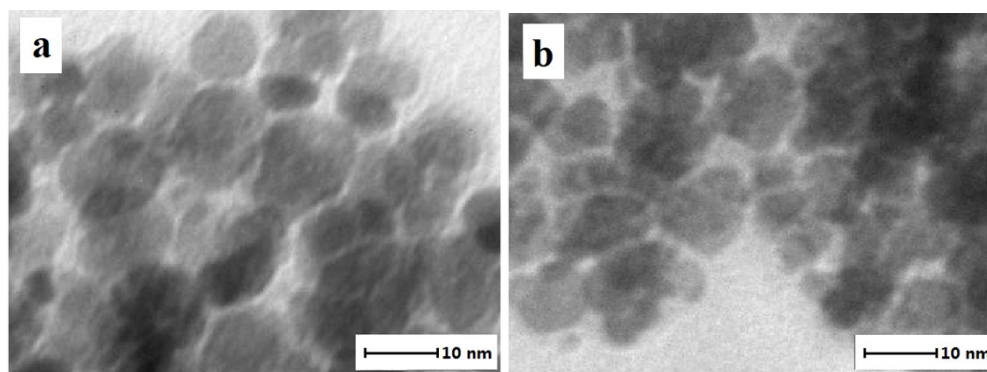
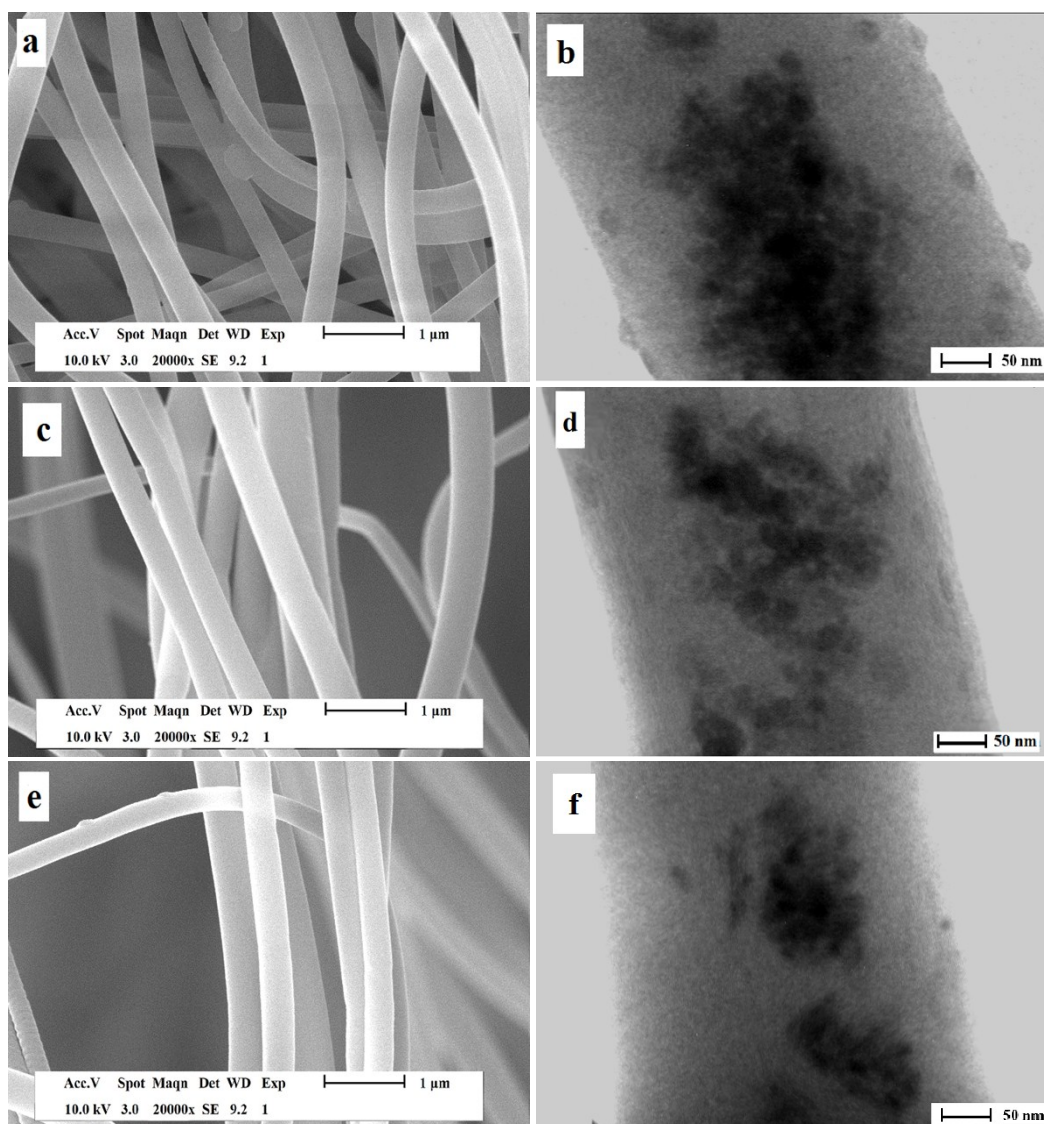


Fig. S1 TEM images of Fe₃O₄ nanoparticles before (a) and after (b) coating oleic acid

SEM and TEM images of all $[\text{Fe}_3\text{O}_4/\text{PANI}/\text{PVP}]@[\text{Eu}(\text{TTA})_3(\text{TPPO})_2/\text{PVP}]$ nanocables samples

Fig. S2 shows the SEM and TEM images of all $[\text{Fe}_3\text{O}_4/\text{PANI}/\text{PVP}]@[\text{Eu}(\text{TTA})_3(\text{TPPO})_2/\text{PVP}]$ nanocables samples. From the SEM observations, it can be seen that all these samples have similar morphologies, and their sizes have no great difference. As seen from the TEM images, one can see that the quantities of Fe_3O_4 nanoparticles in the cores of these nanocables are different. With the adding more Fe_3O_4 nanoparticles into the spinning solution I, the quantity of Fe_3O_4 nanoparticles in the cores of nanocables is increased.



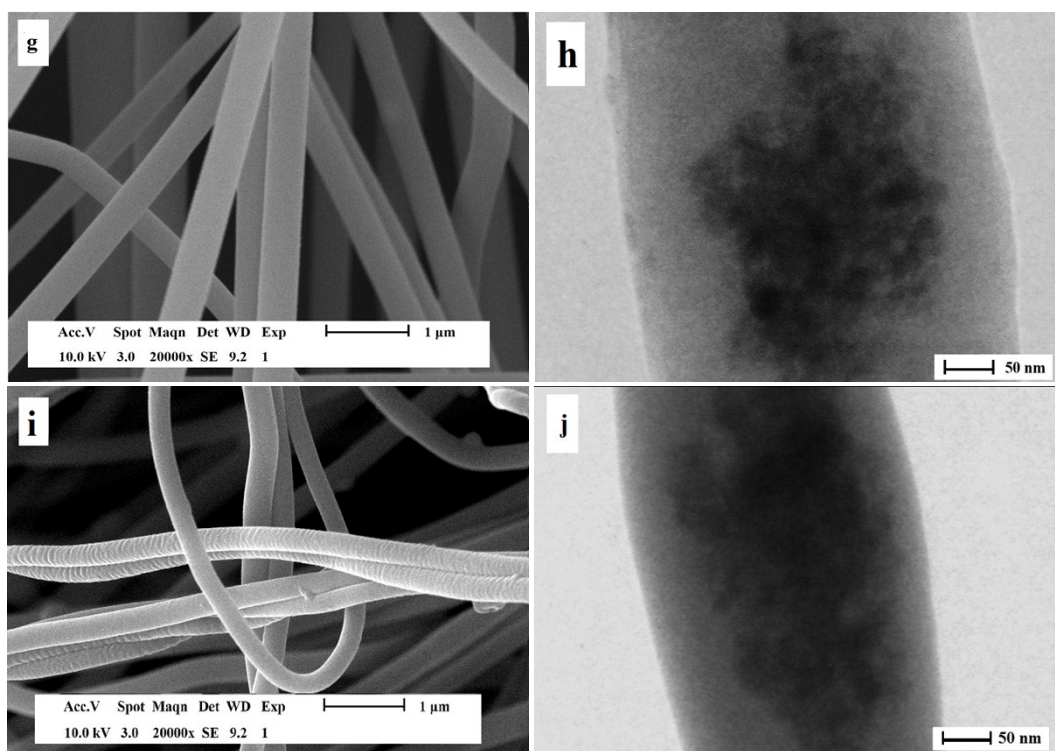


Fig. S2 SEM and TEM images of all $[\text{Fe}_3\text{O}_4/\text{PANI}/\text{PVP}][\text{Eu}(\text{TTA})_3(\text{TPPO})_2/\text{PVP}]$ nanocables samples: (a, b) S1@S6, (c, d)

S2@S6, (e, f) S3@S6, (g, h) S4@S6, (i, j) S5@S6