Supplementary Information

The green preparation of poly N-vinylpyrrole nanoparticles

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PVP(g/L)	Conductivity(S/cm)	$H_2O_2(g/L)$	Conductivity(S/cm)
5	7.037×10 ⁻³	2	4.162×10 ⁻³
10	5.844×10-3	4	3.721×10-3
15	5.447×10 ⁻³	10	5.844×10 ⁻³
20	4.951×10-3	20	6.133×10-3

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Table S1. The conductivity of PNVPY polymers was tested in different concentration of PVP and H_2O_2 . When PVP concentration ranged from 5 to 20 g/L, the radiation power was 30 W, and the concentration of H_2O_2 and H_2SO_4 were 10 g/L and 15 g/L, respectively. When H_2O_2 concentration ranged from 2 to 20 g/L, the radiation power was 30 W, and the concentration of PVP and H_2SO_4 were 10 g/L and 15 g/L, respectively.

The results were calculated according to the formula:

 $\rho = \rho(W/S)(1/2\ln 2)D(d/S)$

W: sample thickness, S: probe spacing, D(d/S): correction function of sample shape and measuring position

Take 10g/L PVP for example, ρ =1.015, W/S=0.251, D(d/S)=0.9312(get by looking up tables), so ρ =5.844×10⁻³ S/cm. The conductivity of PNVPY polymers was slightly lower than the conductivity of PPy (7.67×10⁻³), which was synthesized in our privious work.

It is can be seen that the conductivity of polymers was decreased with the increase of PVP concentrations, but there is no obvious regularity of the change of the concentration of hydrogen peroxide.