Supporting Information for:

Galvanic Replacement Approach for Bifunctional Polyacrylonitrile/Ag-M (M=Au or Pd) Nanofibers as SERS-active Substrates for Monitoring Catalytic Reaction

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Fig. S1 SEM image of electrospun PAN/AgNO₃ nanofibers

Fig. S2 SEM-EDS spectra of PAN/Ag nanofibers (a) PAN/Ag-M(M=Au or Pd) bimetallic nanofibers (b-i) with different composition: (b) PAN/Ag₀.₈Au₀.₂; (c) PAN/Ag₀.₆Au₀.₄; (d) PAN/Ag₀.₄₅Au₀.₅₅; (e) PAN/Ag₀.₃Au₀.₇; (f) PAN/Ag₀.₉Pd₀.₁, (g) PAN/Ag₀.₇₇Pd₀.₂₃; (h) PAN/Ag₀.₆₇Pd₀.₃₃; (i) PAN/Ag₀.₅₄Pd₀.₄₆ bimetallic nanofibers.
**Fig. S3** Cross-sectional TEM images of (a) PAN/Ag nanofibers, (b) PAN/Ag\(_{0.6}\)Au\(_{0.4}\) nanofibers and (c) PAN/Ag\(_{0.9}\)Pd\(_{0.1}\) nanofibers

**Fig. S4** The XRD pattern of (a) PAN/Ag, (b) PAN/Ag\(_{0.8}\)Au\(_{0.2}\), (c) PAN/Ag\(_{0.9}\)Pd\(_{0.1}\), (d) PAN/Ag\(_{0.7}\)Pd\(_{0.3}\), (e) PAN/Ag\(_{0.6}\)Pd\(_{0.3}\), (f) PAN/Ag\(_{0.5}\)Pd\(_{0.4}\) bimetallic nanofibers.

**Fig. S5** TEM images of single fiber for PAN/Ag\(_{0.7}\)Pd\(_{0.3}\) (a), PAN/Ag\(_{0.6}\)Pd\(_{0.3}\) (b) and PAN/Ag\(_{0.5}\)Pd\(_{0.4}\) (c) bimetallic nanofiber
Fig. S6 (a) SERS spectra of R6G (10^{-6}-10^{-11} M) absorbed on PAN/Ag_{0.6}Au_{0.4} bimetallic nanofibers. (b) SERS spectrum of R6G (10^{-11} M) absorbed on PAN/Ag_{0.6}Au_{0.4} bimetallic nanofibers and Raman spectrum of R6G aqueous solution (10^{-4} M).

Fig. S7 Time dependent UV-vis absorption spectra for the reduction of 4-NP by NaBH_4 in the presence of: (a) PAN/Ag; (b) PAN/Ag_{0.6}Au_{0.4}; (c) PAN/Ag_{0.9}Pd_{0.1} bimetallic nanofibers.

Fig. S8 Photos of PAN nanofibers mats (a-e) and PAN/Ag_{0.60}Au_{0.40} nanofibrous mats (f-j) in DMF solution at different time interval
Fig. S9 Time dependent UV-vis absorption spectra for the reduction of 4-NP by NaBH₄ in the presence of: (a) PAN/Ag₀.77Pd₀.23; (b) PAN/Ag₀.67Pd₀.33; (c) PAN/Ag₀.54Pd₀.46 bimetallic nanofibers.; (d) Plot of ln(Aₜ/A₀) as a function of time for the reduction of 4-NP by NaBH₄ catalyzed by PAN/Ag₀.90Pd₀.10, PAN/Ag₀.77Pd₀.23, PAN/Ag₀.67Pd₀.33, and PAN/Ag₀.54Pd₀.46 bimetallic nanofibers.

Fig. S10 The relationship between the ratio of intensity of the 1589 cm⁻¹ to the 1575 cm⁻¹ and reaction time.