Supplementary Materials

Smart Thermomechanochemical Composite Materials Driven by Different Forms of Electromagnetic Radiation

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Figure S1. Effect of microwaves on the doped (protonated) nanocomposite (made by PIH) along the heating and cooling cycle. Photographs: (a) before irradiation \((T = 29.7 \, ^\circ C)\), (b) after microwave irradiation \((30 \, s, 70 \, W) \, (T = 38.9 \, ^\circ C)\), (c) after cooling in air \((T = 27.3 \, ^\circ C)\). Temperatures measured using a thermographic camera.

Scheme S1. Formation of the nanocomposite by loading nanoparticles inside macroporous hydrogels (INH).
**Scheme S2.** In-situ gelation of the smart hydrogel matrix around the dispersion of conductive polymer nanoparticles (GAN).

**Scheme S3.** In-situ polymerization of the conductive polymer inside the smart hydrogel matrix to produce a nanocomposite (IPH).

**Scheme S4.** PANI chains loading from solution into cPNIPAM hydrogel (AMH).
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