Electronic Supplementary Material (ESI) for Nanoscale

Supporting Information

Metal Nanoparticle Fluids with Magnetically-Induced Electrical Switching Properties

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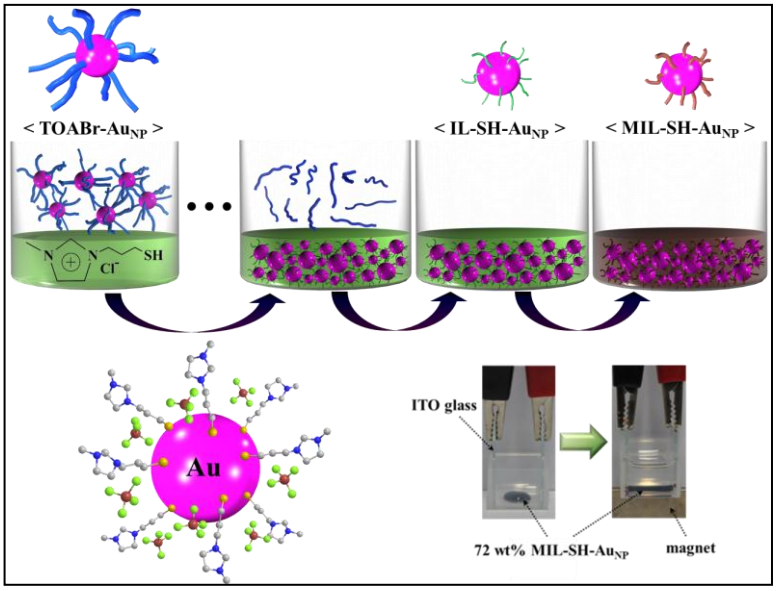


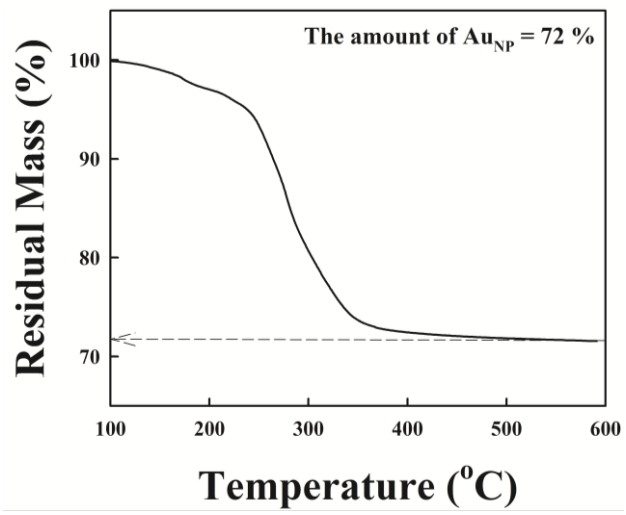


Figure S1. Thermogravimetric analysis (TGA) of MIL-SH-Au$_{NP}$ fluids with the loading amount of 72 wt% Au$_{NP}$.

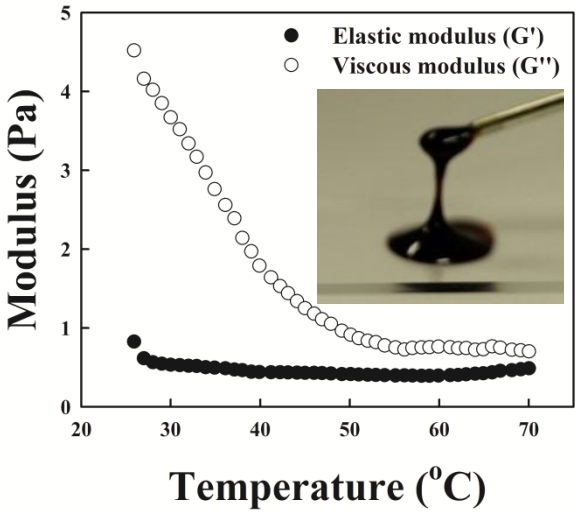
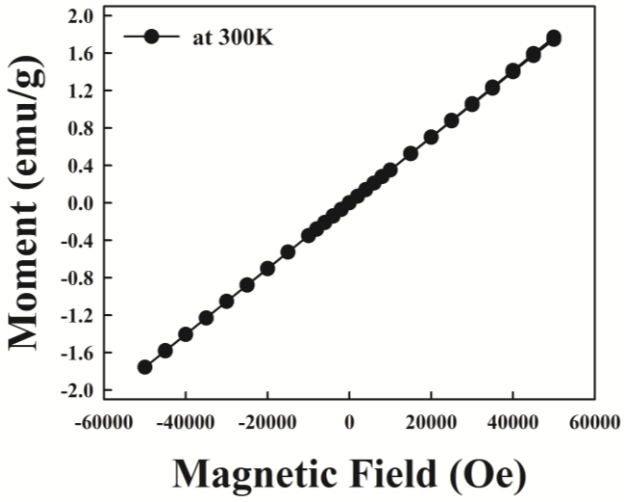


Figure S2. Elastic and viscous moduli as a function of temperature for MIL-SH. The Inset demonstrates the fluidic behavior of MIL-SH.

(a)



(b)

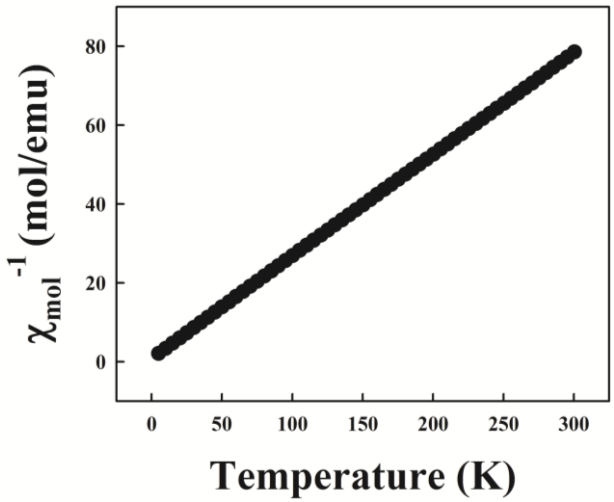


Figure S3. (a) Magnetization data of MIL-SH as a function of the external magnetic field measured at 300 K. (b) The reciprocal molar susceptibility curve of MIL-SH obtained to confirm the paramagnetic property.

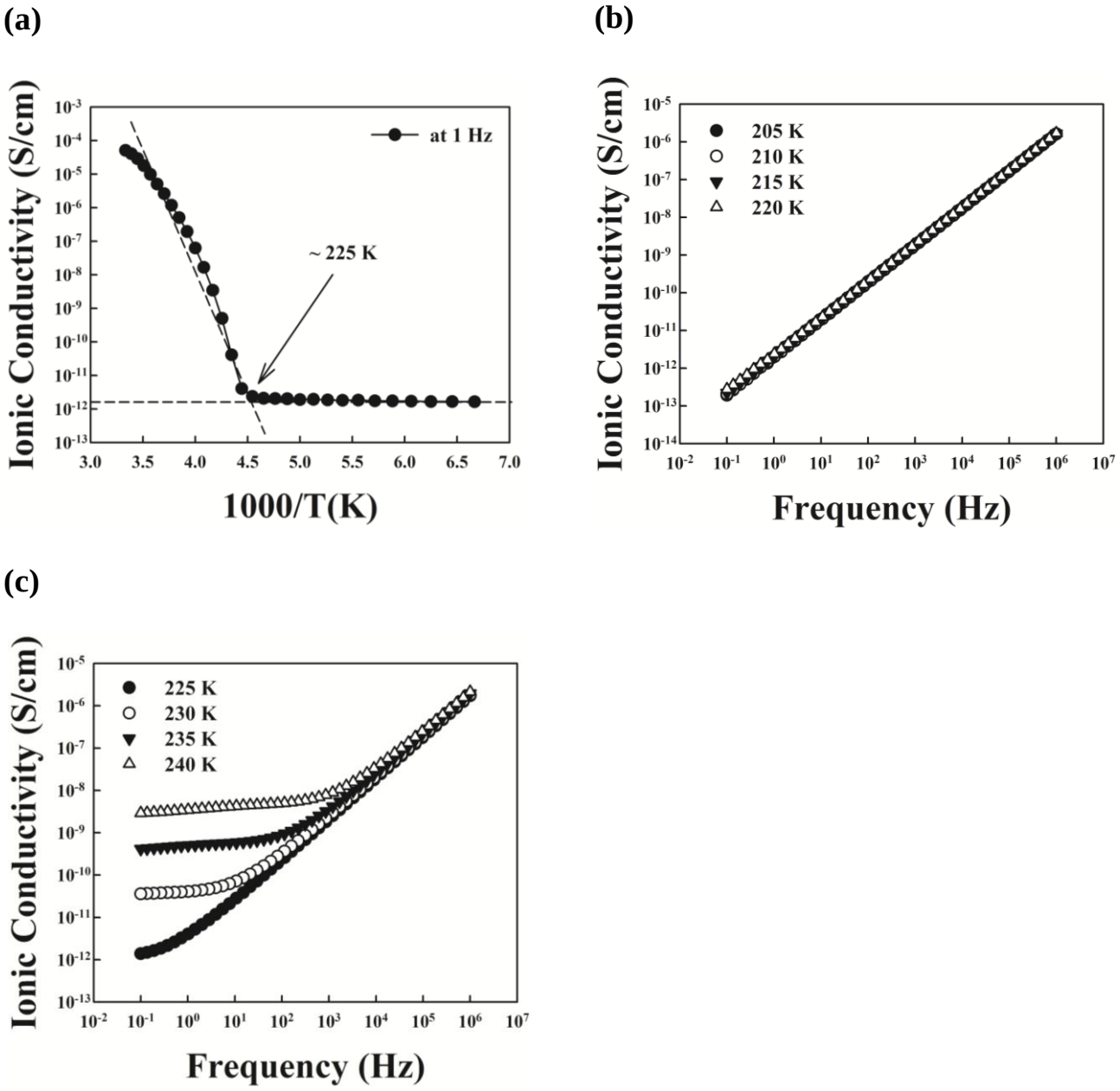


Figure S4. (a) Temperature-dependent ionic conductivity of MIL-SH measured at a fixed frequency of 1 Hz. Frequency-dependent ionic conductivity of MIL-SH at temperatures (b) below and (c) above T_g.

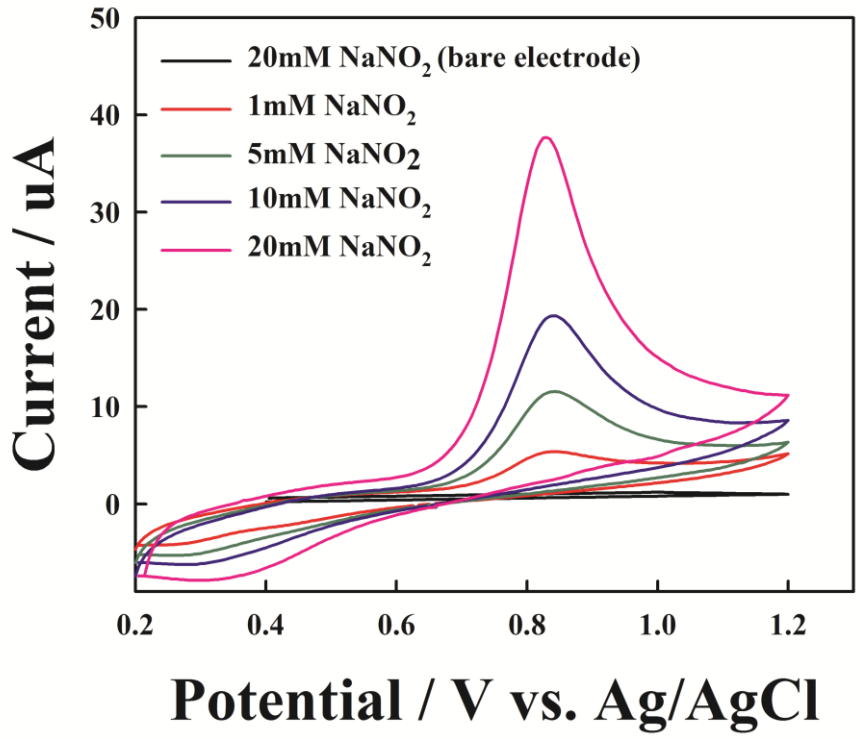


Figure S5. Cyclic voltammograms (CV) of a bare ITO and $(MIL\text{-}SH\text{-}Au_{NP}/PSS)_5$ multilayer-coated ITO electrode in pH 3.0 PBS solution as a function of concentration of $NaNO_2$. The measured scan rate is 50 mV s^{-1}. The electrochemical activities of multilayers adsorbed onto ITO electrodes were investigated by cyclic voltammetry (CV) (model: compactstat, IVIUM). NO sensing was performed using $NaNO_2$ stock solutions. $NaNO_2$ can generate free NO according to the following reaction, $3HONO \rightarrow H+ + NO_3^- + 2NO + H_2O$.