Electronic Supporting Information

for

Thermal Stability and Swelling Behaviors of Nanoscale Ionic Materials (NIMs) with Tuned Structure

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CONTENT

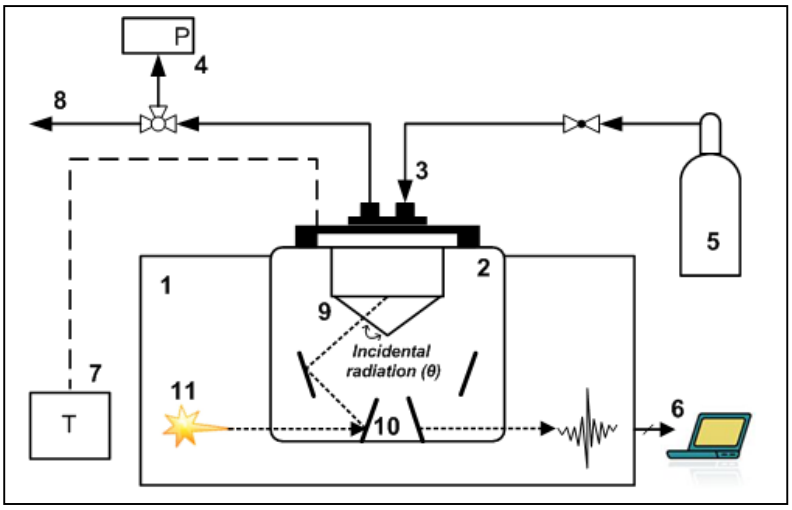

Figure S1. Schematic of the in-situ measurements of CO_2 capture capacity as well as thermally- and CO_2-induced swelling of NIMs. (1) FT-IR spectrometer (Nicolet 6700, Thermo Fisher Scientific Inc.); (2) ATR optics and high pressure fluid cell (Golden Gate^{TM}, Speca Ltd., UK); (3) Gas inlet; (4) Digital pressure gauge; (5) Gas cylinder; (6) Data acquisition system; (7) Temperature controller; (8) Vent; (9) Diamond crystal; (10) Mirrors; (11) Infrared light source.

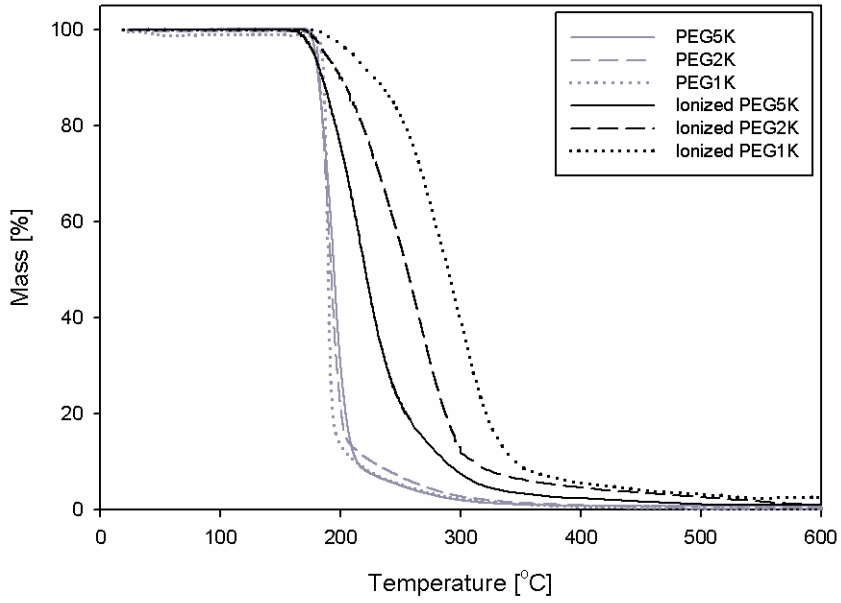

Figure S2. Thermal stability of Ionized PEGs with various molecular weights and the corresponding PEGs determined using a TGA, in oxygen environment with a ramping rate 5 ºC/min.

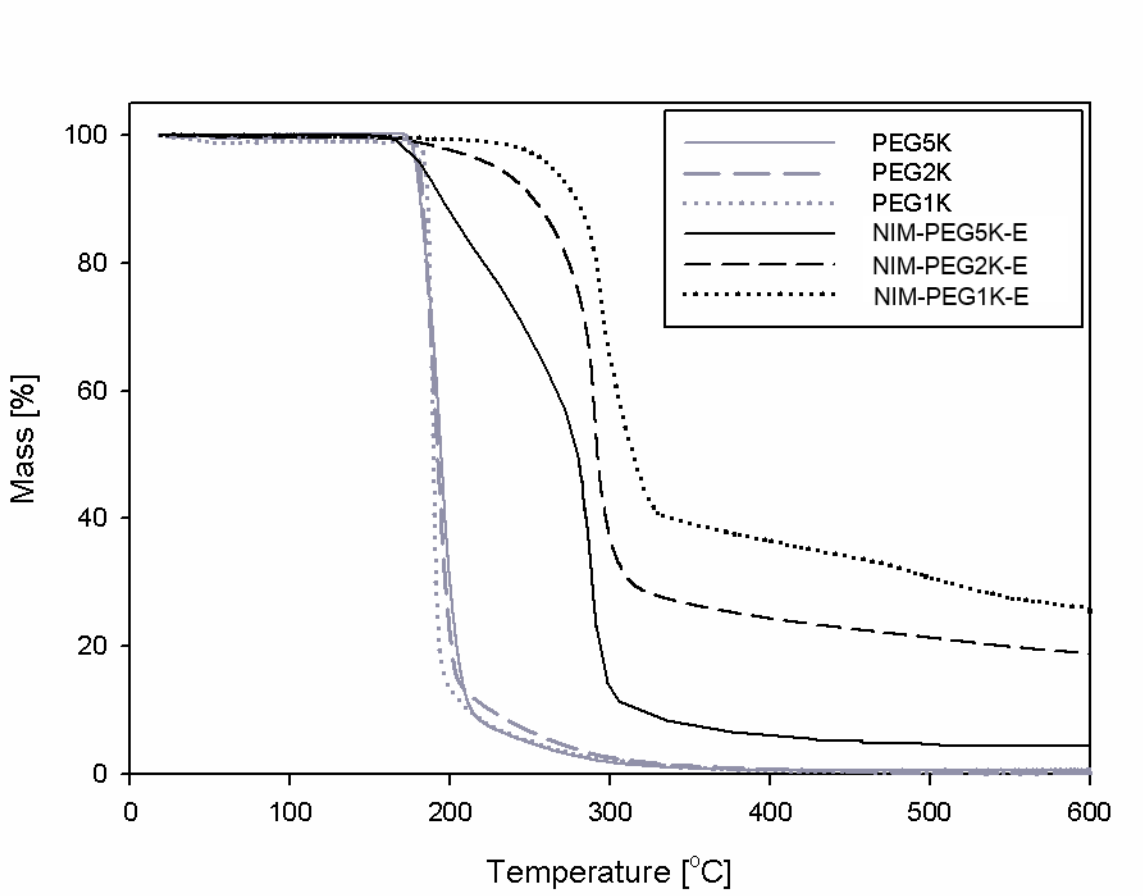

Figure S3. Thermal stability of NIMs with various chain lengths and the corresponding PEGs determined using a TGA, in oxygen environment with a ramping rate 5 ºC/min.

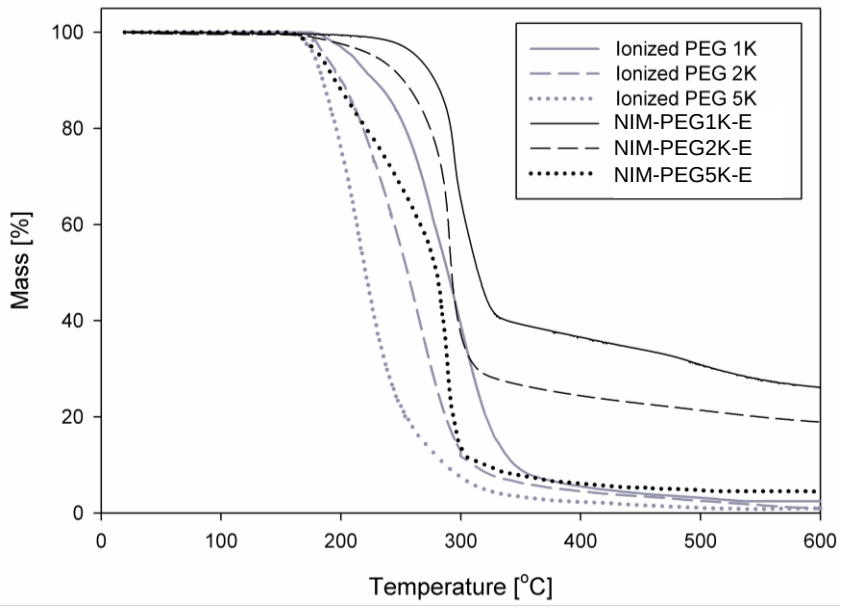

Figure S4. Thermal stability of NIMs with various chain lengths and the corresponding Ionized PEGs determined using a TGA, in oxygen environment with a ramping rate 5 ºC/min.

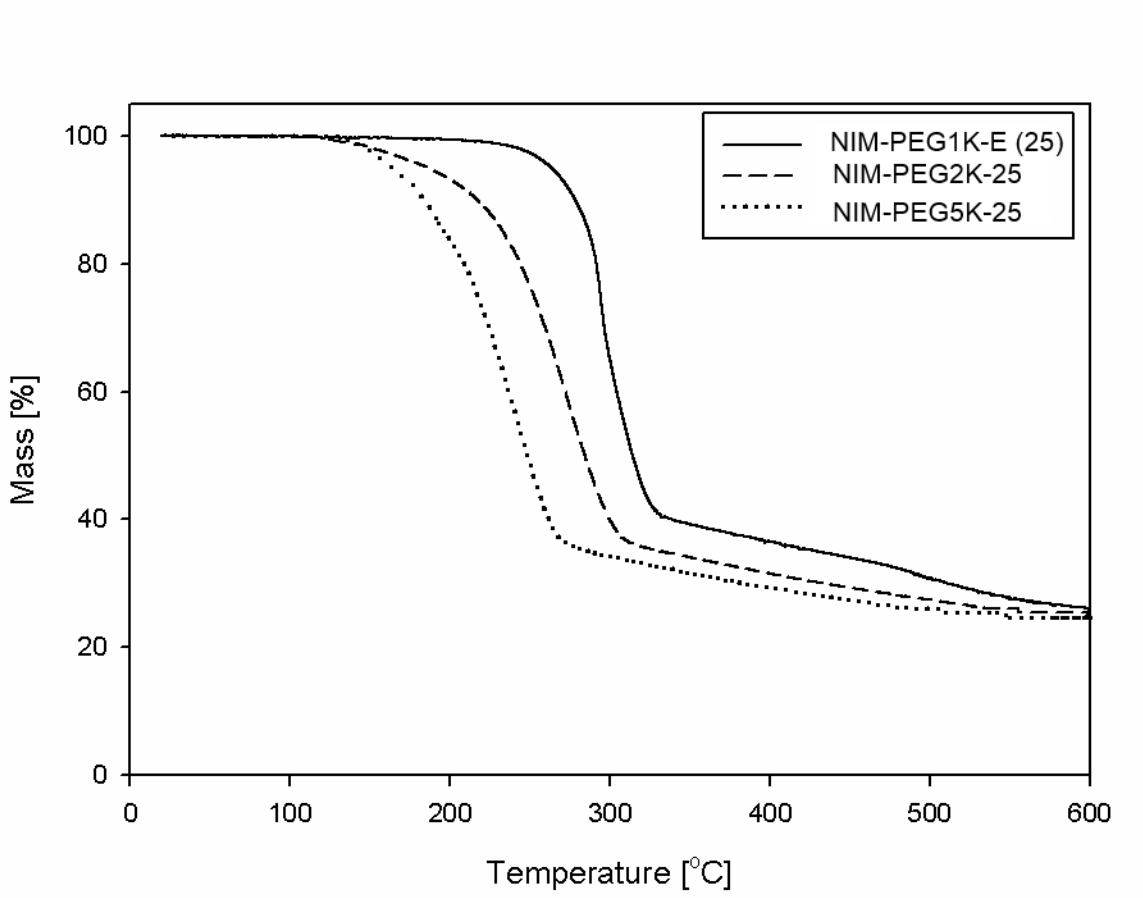

Figure S5. Thermal stabilities of NIMs with the same core fraction but different chain lengths determined using a TGA, in oxygen environment with a ramping rate 5 ºC/min.

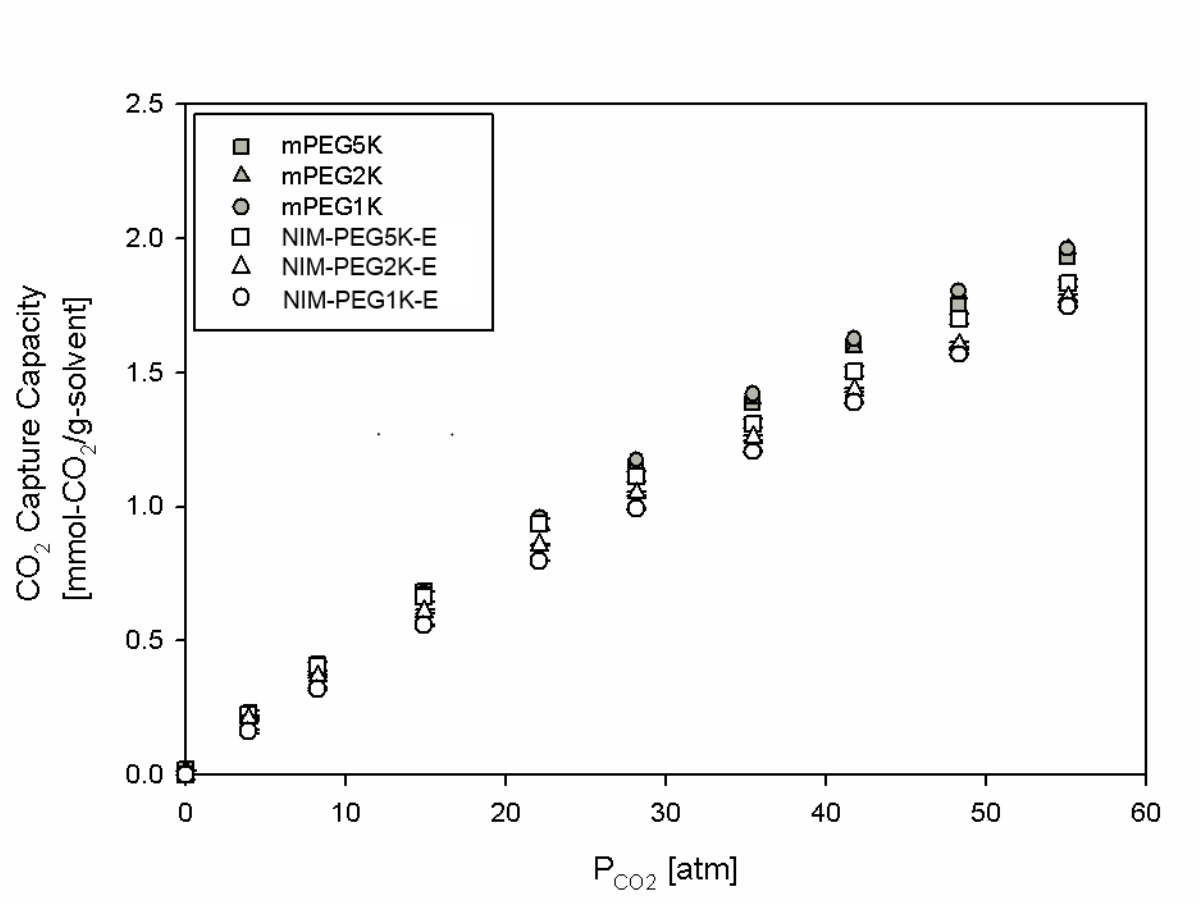

Figure S6. CO_2 capture capacity in NIMs with various chain lengths at 60 ºC and P_{CO2} = 4 – 55 atm.

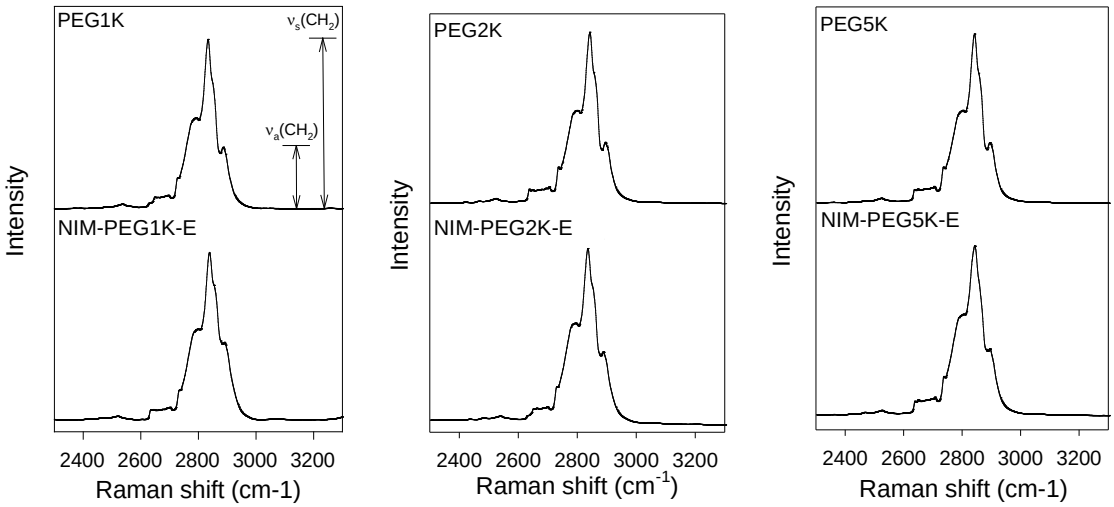

Figure S7. Raman spectra in the $\nu_a(CH_2)$ and $\nu_s(CH_2)$ regions for PEGs and NIM-I-PEGs.