# Sustained Drug Release on Temperature-responsive Polymer Hybrid Nanoporous Silica/HAP Composites

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This work describes the potential bio-application of hierarchically ordered nanoporous materials for the smart drug delivery system that involves a self-assembly process at the molecular level based upon thermo-responsive polymers. Thermosensitive polymer hybrid nanoporous materials were developed based on tailoring network of PNIPAm for smart drug release, and showed a sustained positive thermoresponsive drug release profile in which the overall release amount was controlled by change of the pore channel size. The pore size distribution and BET isotherms by modification of PNIPAm polymers changed the adsorption and desorption branch and microporous pattern of isotherm hysteresis. The FT-IR spectra proved the presence of the PNIPAm network with no other significant components in which bands were observed at 1645, 1370, and 2800-3000 $cm^{-1}$ for the carbonyl group, isobutyl group, and aliphatic hydrocarbon of PNIPAm, and 1080cm-1 for the SiO2 network, respectively. Thermo-gravimetric analysis for PNIPAm hybridized materials (C1–C3) was conducted up to 500 ℃ (10°C/min).