Electronic Supplementary Material (ESI) for Soft Matter.

Supplementary information

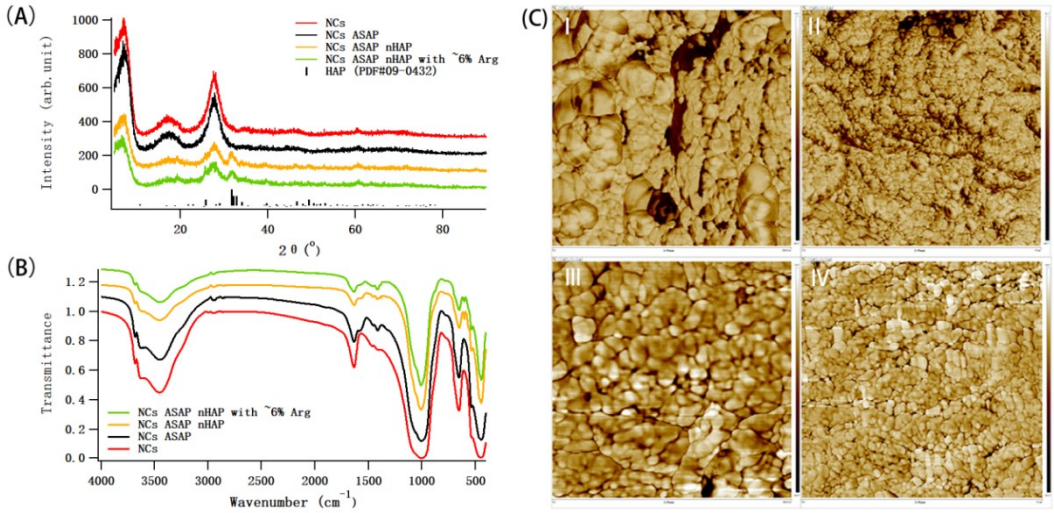

Figure S1. Characterization of NC/nHAP composites. A) XRD patterns and B) FTIR spectrum of the composites. C) AFM images of composites based on NCs with (I and II) nHAP and (III and IV) Arg-modified nHAP, respectively.

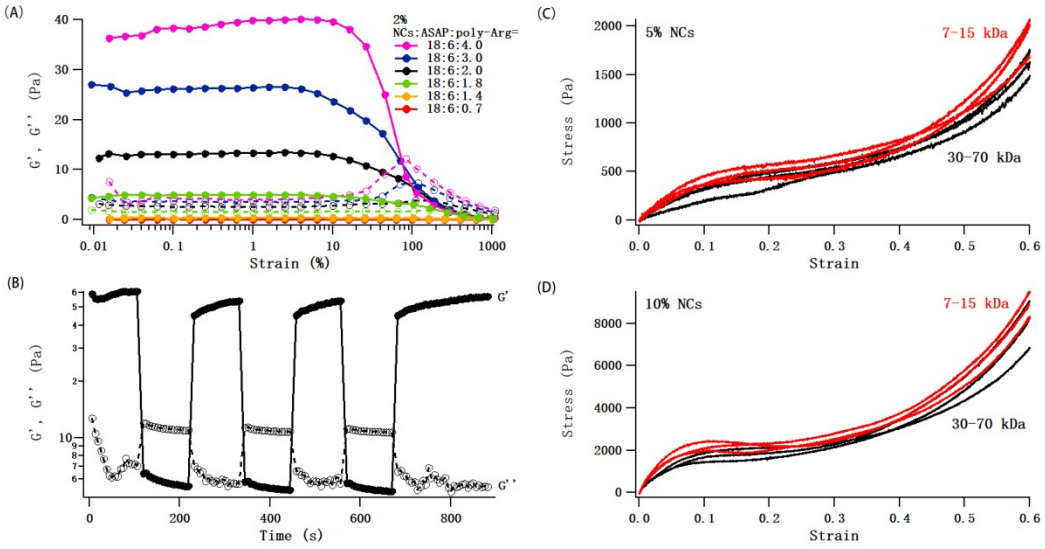

Figure S2. Mechanical properties of the physically crosslinked gels based on nano-clays (NCs) and poly-Arg. A) Rheological properties of 2% gels with different amounts of poly-Arg in strain-sweeping mode. B) Changes of storage moduli G' and loss modulus G'' of the 2% gels with a charge ratio of $[NCs\,(-)]$:$[poly-Arg\,(+)]$:$[ASAP\,(-)] = 18.0{:}4.0{:}6.0$ in continuous step strain measurements. Representative stress-strain curves obtained from compressive mechanical tests on the C) 5% and D) 10% gels. No significant influence of the molecular weight of poly-Arg was observed.

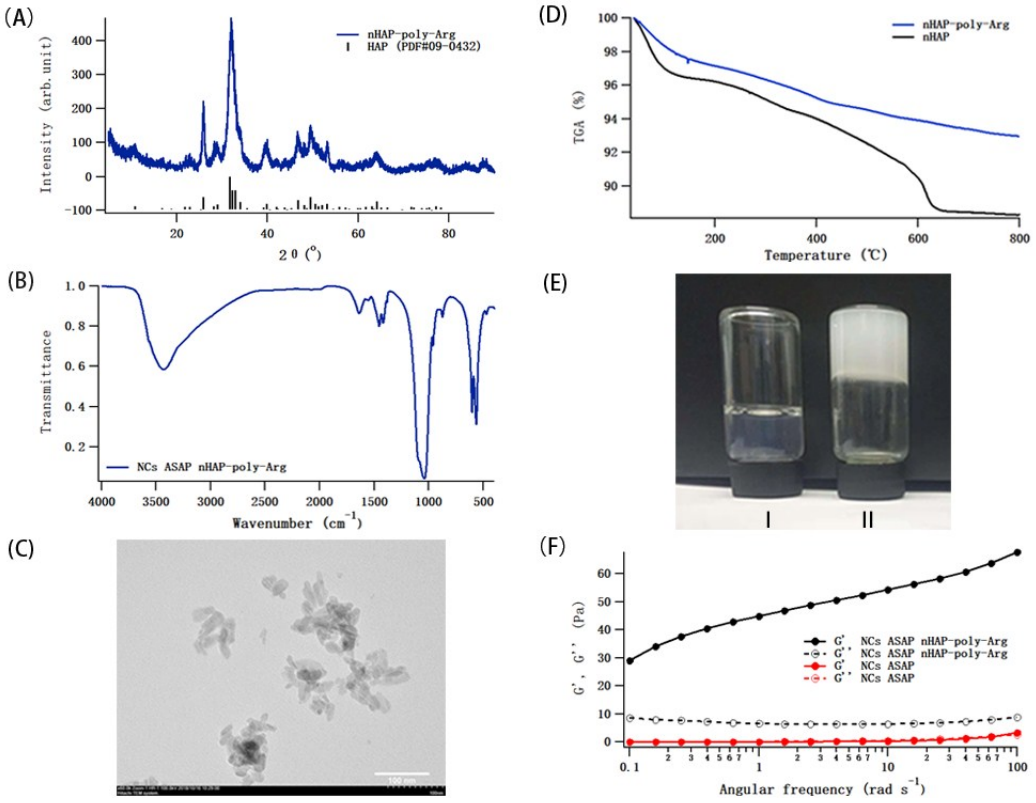

Figure S3. Formation of physically crosslinked gels based on nano-clays (NCs) and nHAP-poly-Arg. A) XRD patterns, B) FTIR spectrum and C) TEM images of nHAP-poly-Arg. D) TGA measurements of nHAP and nHAP-poly-Arg in the temperature range of [40, 800]℃. Coating efficiency of poly-Arg was calculated to be ~4.68%. E) Photographs of 10% NCs (pre-treated with ASAP) without (left) and with (right) 30 mg nHAP-poly-Arg, corresponding to a charge ratio of $[NCs\ (-)]$:$[nHAP-poly-Arg\ (+)]$:$[ASAP\ (-)] = 18.0$:1.8:6.0.F) Rheological properties of the resultant gels in frequency-sweeping mode.

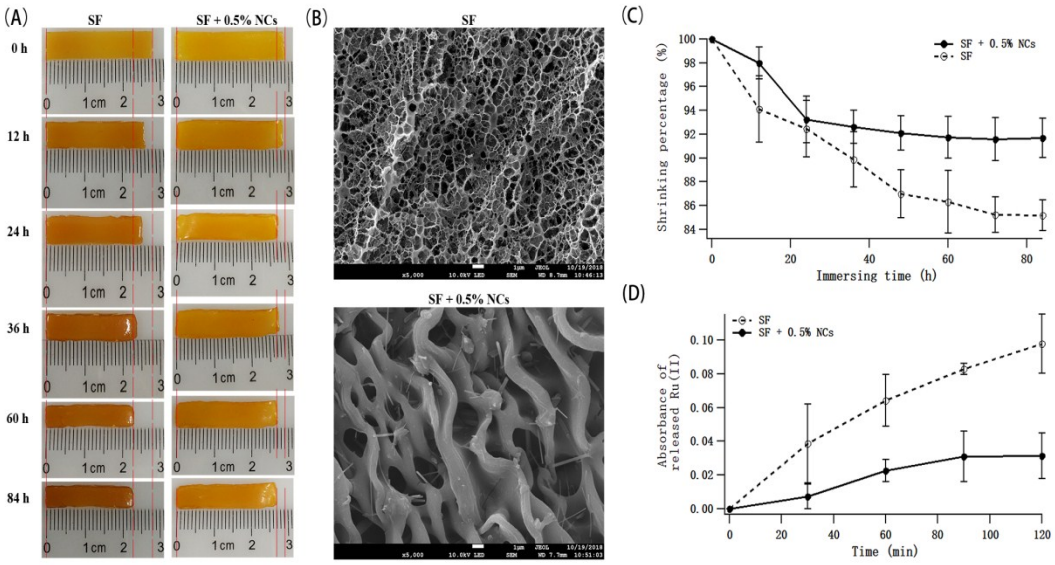

Figure S4. Properties of chemically crosslinked SF-based hydrogels in the presence and absence of physically crosslinked NC-based network. A) Photographs, B) SEM images, C) shrinking and D) Ru(II)-releasing profiles of the hydrogels after being immersed in deionized water for certain time periods.