DOI: 10.1002/anie.201200267

A Strong Bio-Inspired Layered PNIPAM–Clay Nanocomposite Hydrogel**

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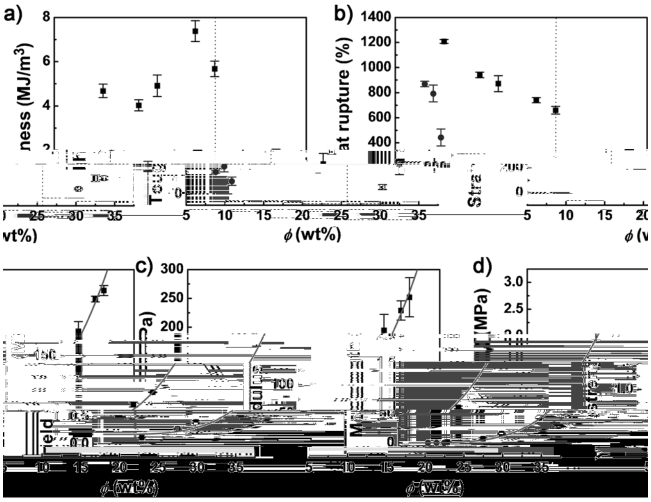

Figure 2. Effects of the clay concentration, f, on the mechanical properties of R-NC (circles) and L-NC (squares) gels. a) Dependence of the toughness on the clay concentration. The toughness of the L-NC gel containing 23.2 wt% clay is six times greater than that of R-NC gels containing 9.9 wt% clay. b) Dependence of the strain at rupture on the clay concentration. For f > 25.7 wt%, the L-NC gels dramatically become brittlelike with lower extensibility and toughness. c) The initial elastic modulus, *E*, increases with increasing f. d) The yield strength, s_y, increases with increasing f. The prediction of a typical power-law scaling of gel systems is in excellent agreement with the experimental values. The error bars correspond to the standard deviation obtained from at least three samples.

$$E = A(\phi - \phi\ )^p \qquad ( )$$

$$\sigma_y = \sigma\ + B(\phi - \phi\ )^p \qquad ( )$$

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