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**Structure and mechanical properties of hydrophobically modified hydrogels** GUILLAUME MIQUELARD-GARNIER, DOMINIQUE HOURDET, ESPCI, Paris, France, COSTANTINO CRETON, ESPCI, Paris, France — Chemically crosslinked hydrogels based on polyacrylic acid chains modified with short hydrophobic C12 side groups have been synthesized in water at a polymer concentration varying between 4 and 10 % in weight. In the absence of hydrophobic groups, the hydrogels behave as soft elastic solids with an elastic modulus in the few kPa range. With the introduction of even a few percent of C12 hydrophobic side chains, the dissipative component of the shear modulus increases by two orders of magnitude, while the elastic component remains unchanged. This causes a large increase in the hysteresis at large strains and an increase in the fracture toughness of the gel. We demonstrate that this change in properties is due to the formation of labile nanoclusters of the hydrophobic groups in the aqueous phase.

Guillaume Miquelard-Garnier  
ESPCI, Paris, France

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