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Novel emulsions stabilized by pH and temperature sensitive microgels TO NGAI, The Chinese University of Hong Kong, HELMUT AUWETER, BASF, SVEN BEHRENS, BASF — Poly(N-isopropylacrylamide-co-methacrylic acid) (PNIPAM-MAA) microgel particles in aqueous solution exhibit a volume phase transition that can be induced by changes of either pH or temperature. In the swollen state, these microgels self-assemble at an octanol-water interface and can be used to stabilize surfactant-free oil-in-water emulsions. This stabilizing efficiency is retained even in the collapsed state, provided that the microgels are fully charged. At very low charge (low pH), on the other hand, the microgels migrate completely into the oil phase, and the emulsion breaks. In an intermediate regime of practical interest the emulsion stability can be tuned by small adjustments of pH or temperature. Because of this unprecedented stability control, we believe that such stimulus-responsive charged microgels have a great potential for applications in the field of cosmetic or pharmaceutical formulations. Conceptually they belong to a new class of emulsifiers combining properties of both classical surfactants and solid particles.

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