Smart microgels in the adsorbed state: Properties and potential applications

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Microgels based on poly(N-isopropylacrylamide) (PNIPAM) belong to the class of so called smart materials, which are able to respond upon changes of an external parameter like e.g. temperature by changes in particle dimensions. This contribution will briefly review the properties of these materials.
Recently, we have prepared monolayer films from these particles [1,2]. Microgels are attached non-covalently allowing us to use them on a broad variety of (charged) surfaces. This is a major advantage as compared to approaches relying on covalent attachment of active films. The shape of the coated substrate shouldn't be of importance.
Such thermoresponsive poly(N-isopropylacrylamide) (PNIPAM) microgel films are shown to allow controlled detachment of adsorbed vertebrate cells via simply changing the temperature. Cell response occurs on the timescale of several minutes, is reversible, and allows to harvest vertebrate cells in a mild fashion [3].

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