Stimuli-responsive nanoparticles, nanogels and capsules for integrated multifunctional intelligent systems (Review, 2010)

Description

In this review we provide an analysis of recent literature reports on the synthesis and applications of stimuli-responsive polymeric and hybrid nanostructured particles in a range of sizes from nanometers to a few micrometers: nano- and microgels, core–shell structures, polymerosomes, block-copolymer micelles, and more complex architectures. The review consists of two major parts: synthesis and applications of nanoparticles in colloidal dispersions, thin films, delivery devices and sensors. We also broadly discuss potential directions for further developments of this research area.

Motornov, M., Roiter, Y., Tokarev, I., & Minko, S.. (2010). Stimuli-responsive nanoparticles, nanogels and capsules for integrated multifunctional intelligent systems. Progress in Polymer Science, 35(1–2), 174–211.

Plain numerical DOI: 10.1016/j.progpolymsci.2009.10.004
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“In this review we provide an analysis of recent literature reports on the synthesis and applications of stimuli-responsive polymeric and hybrid nanostructured particles in a range of sizes from nanometers to a few micrometers: nano- and microgels, core-shell structures, polymerosomes, block-copolymer micelles, and more complex architectures. the review consists of two major parts: synthesis and applications of nanoparticles in colloidal dispersions, thin films, delivery devices and sensors. we also broadly discuss potential directions for further developments of this research area. © 2009 elsevier ltd. all rights reserved.”
Buwalda, S. J., Boere, K. W. M., Dijkstra, P. J., Feijen, J., Vermonden, T., & Hennink, W. E.. (2014). Hydrogels in a historical perspective: From simple networks to smart materials. Journal of Controlled Release, 190, 254–273.

Plain numerical DOI: 10.1016/j.jconrel.2014.03.052
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“Over the past decades, significant progress has been made in the field of hydrogels as functional biomaterials. biomedical application of hydrogels was initially hindered by the toxicity of crosslinking agents and limitations of hydrogel formation under physiological conditions. emerging knowledge in

polymer chemistry and increased understanding of biological processes resulted in the design of versatile materials and minimally invasive therapies. hydrogel matrices comprise a wide range of natural and synthetic polymers held together by a variety of physical or chemical crosslinks. with their capacity to embed pharmaceutical agents in their hydrophilic crosslinked network, hydrogels form promising materials for controlled drug release and tissue engineering. despite all their beneficial properties, there are still several challenges to overcome for clinical translation. in this review, we provide a historical overview of the developments in hydrogel research from simple networks to smart materials."

See also:
Fluorescent probe-encapsulated smart nanohydrogel to enhance sensitivity toward hydrogen peroxide in living cells (Publication Date, Feb. 2023)
www.sciencedirect.com/science/article/abs/pii/S0143720822008609

- Advances in the development of cyclodextrin-based nanogels/microgels for biomedical applications: Drug delivery and beyond 2022, *Carbohydrate Polymers*
- Formation of ultrathin scarf-like micelles, ultrathin disk-like micelles and spherical micelles by self-assembly of polyurethane diblock copolymers 2022, *Journal of Molecular Liquids*
- Inorganic/organic hybrid nanoparticles synthesized in a two-step radiation-driven process 2022, *Radiation Physics and Chemistry*
- The influence of the functional end groups on the properties of polylactide-based materials 2022, *Progress in Polymer Science*
- How molecular interactions tune the characteristic time of nanocomposite colloidal sensors 2022, *Journal of Colloid and Interface Science*

Category

1. Covid
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Tags

1. Carbohydrate Polymers
2. Microgel
3. Nanocomposite sensors
4. Nanohydrogel
5. Nanoparticles
6. Self-assembling micelles

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