

Supraparticles – new functionalities via assembly of long-known colloidal building blocks to complex particulate entities

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Tremendous progress has been made in tailoring colloidal nanoparticles in terms of composition, size and shape. The next step is to consider these colloids as the atoms of tomorrow [1] and build “molecules”, i.e., more complex particulate units from them (Fig. 1).

Firstly, it will be argued in the talk why such objects should be termed supraparticles [2] and due to which new functionalities, such objects can be considered unique and a step beyond classical nanoparticle science.

Secondly, recent findings of novel functionalities for such particles will be presented.

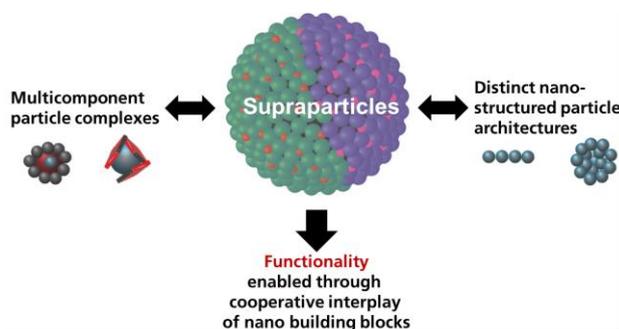


Figure 1. Unexpected functionalities emerge from assembly of nano building blocks to supraparticles.

For the creation of supraparticles, long-known colloidal nanoparticles such as iron oxide and silica nanoparticles were used as building blocks and assembled e.g. via spray-drying. It turns out that based on the supraparticulate architecture and composition unexpected functionalities emerge. As examples, magnetic micro-rods exhibiting anisotropic optical properties [3- 5] and luminescent supraparticles expanding the horizon of mechanochromics [6] will be shown.

Literature:

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- [6] S. Wintzheimer, J. Reichstein, S. Wenderoth, *Adv. Funct. Mater.*, just accepted, DOI: 10.1002/adfm.201901193

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