

Superstructures of Nanocrystals

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The assembly of quantum dots QDs into functional architectures and further applications of these nanomaterials in e.g lightning, sensing and catalysis are currently amongst the hottest topics in QD research [1]. We will report on latest developments in this field in our group with respect to a) enzyme encapsulated QD hydrogels as a multi-functional platform in the development of optical biosensors [2], b) the electrocatalytical activity towards the oxidation of ethanol of a freestanding palladium nanoparticle aerogel with extremely high electrocatalytic current density and good durability [3], and c) colloidal nanocrystals embedded in macrocrystals and their application in a colour conversion LEDs with good robustness, photostability, and color purity [4].

[1] a) J.L. Mohanan, I.U. Arachchige, S.L. Brock, *Science* 307 (2005) 397

b) N. Gaponik, A.-K. Herrmann, A. Eychmüller, *J. Phys. Chem. Lett.* 3 (2012) 8

c) P. Simon, E. Rosseeva, I.A. Baburin, L. Liebscher, S.G. Hickey, R. Cardoso-Gil, A. Eychmüller, R. Kniep, W. Carrillo-Cabrera, *Angew. Chemie Int. Ed* 51 (2012) 10776

[2] J. Yuan, N. Gaponik, A. Eychmüller, *Anal. Chem.* 84 (2012) 5047

J. Yuan, N. Gaponik, A. Eychmüller, *Angew. Chem. Int. Ed.* 52 (2013) 976

[3] W. Liu, A.-K. Herrmann, D. Geiger, L. Borchardt, F. Simon, S. Kaskel, N. Gaponik, A. Eychmüller, *Angew. Chem. Int. Ed.* 51 (2012) 5743

[4] T. Otto, M. Müller, P. Mundra, V. Lesnyak, H.V. Demir, N. Gaponik, A. Eychmüller, *Nano Lett.* 12 (2012) 5348