Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Highly luminescent YAG:Ce ultra-small nanocrystals, from stable dispersions to thin films.

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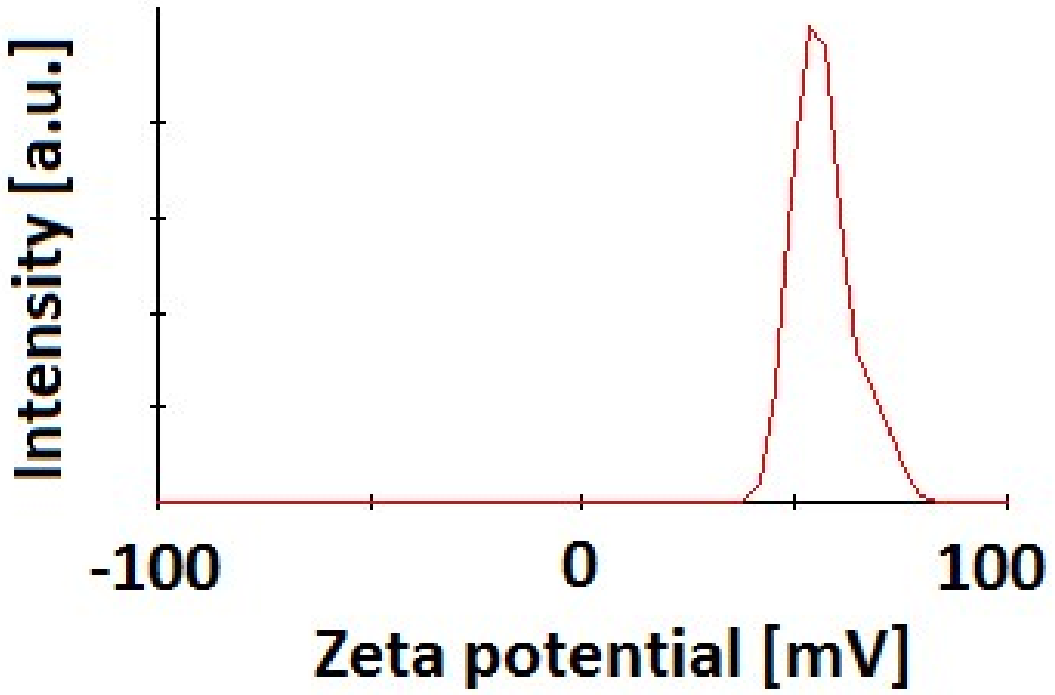

Fig. S1 Zeta potential measured on the YAG colloidal solution prepared from YAG nanocrystals in water after purification and dialysis (pH=7,2).

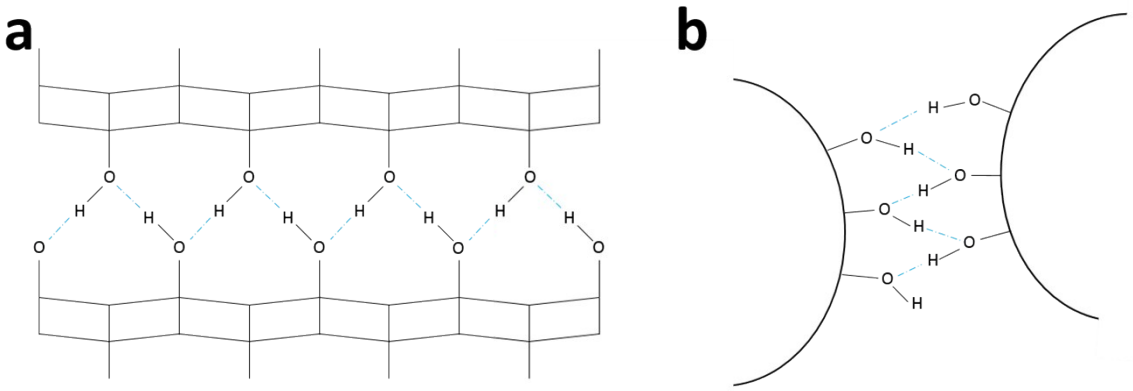

Fig. S2 Schematic picture of: **a)** hydrogen bonding between boehmite layers and **b)** speculative hydrogen bonding between aggregating particles.

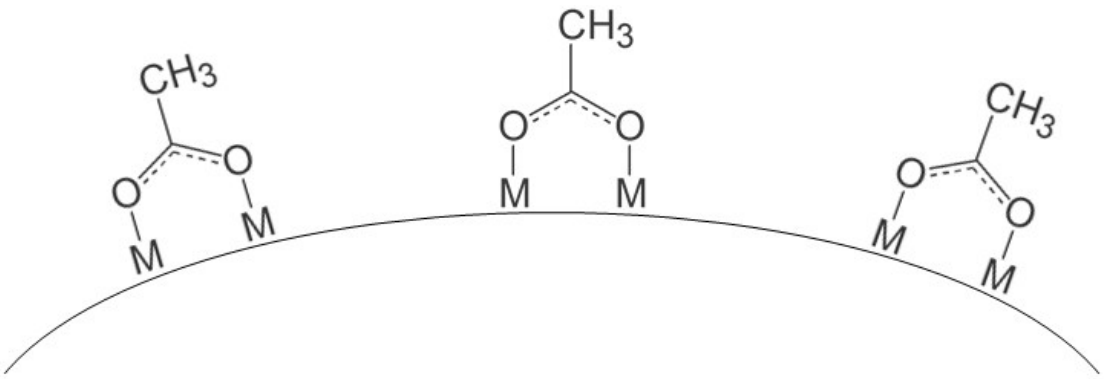

Fig. S3 Schematic picture of bridging bidentate mode of acetates on the surface of YAG. M represents cation of most likely aluminium, but yttrium is also possible.

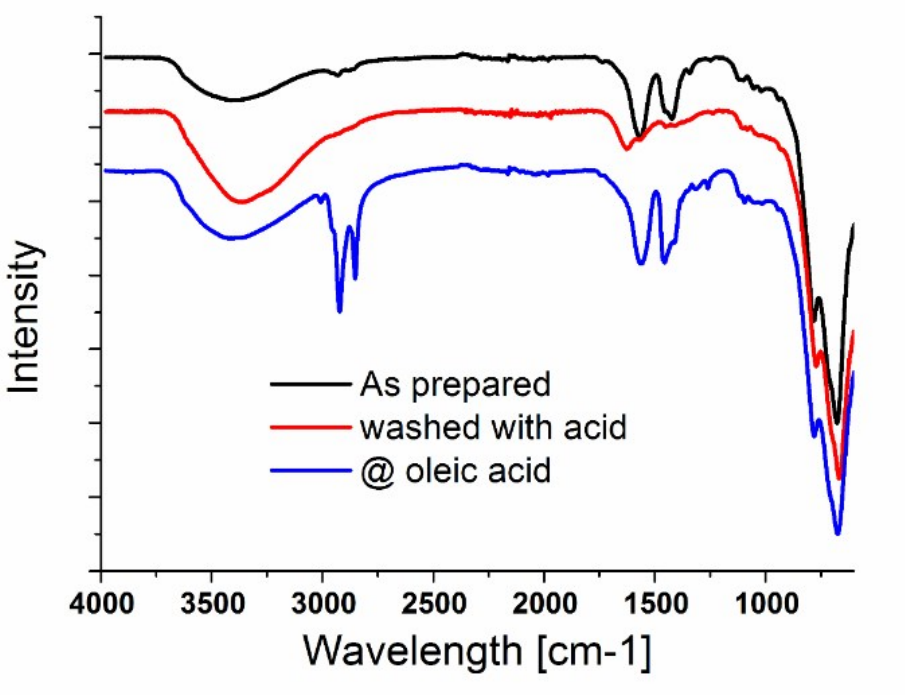

Fig. S4 FTIR spectra of: YAG as prepared from the mixture of 1,4-BD and DEG in anhydrous conditions (black); washed with acidic water (red); washed with acid and covered with oleic acid (blue)

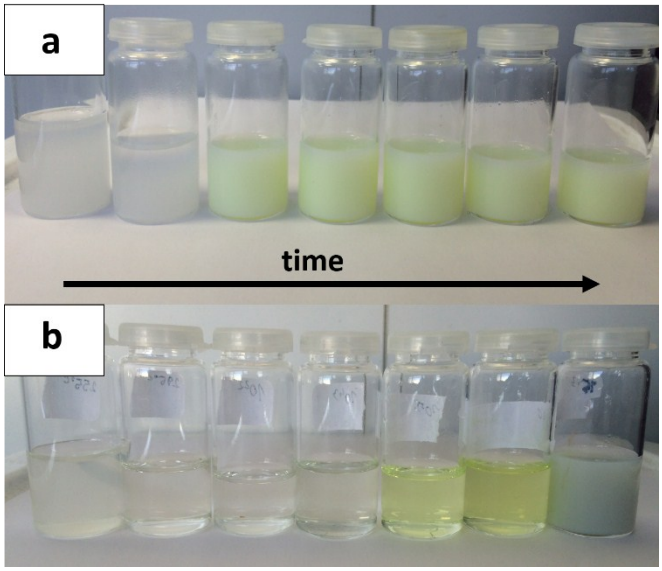

Fig. S5 Comparison of reaction mixture aspect evolution within time. A) YAG prepared in neat 1,4-BD and b) with DEG and dehydrated precursors. Yellowish colour of colloids appeared when crystalline YAG phase was present. After 4,5h of heat treatment in the mixture of 1,4-BD and DEG, colloid turned greyish – bluish, due to the decomposition of DEG.

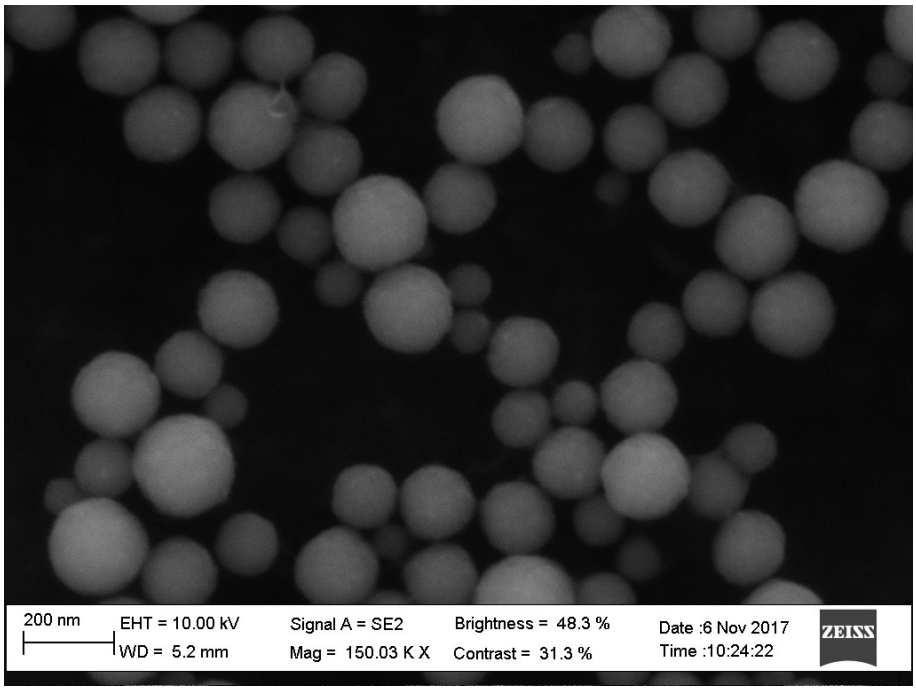

Fig. S6 SEM image of YAG:Ce NPs denoted as DEG7W. Clearly, higher amount of water increased the size of NPs.

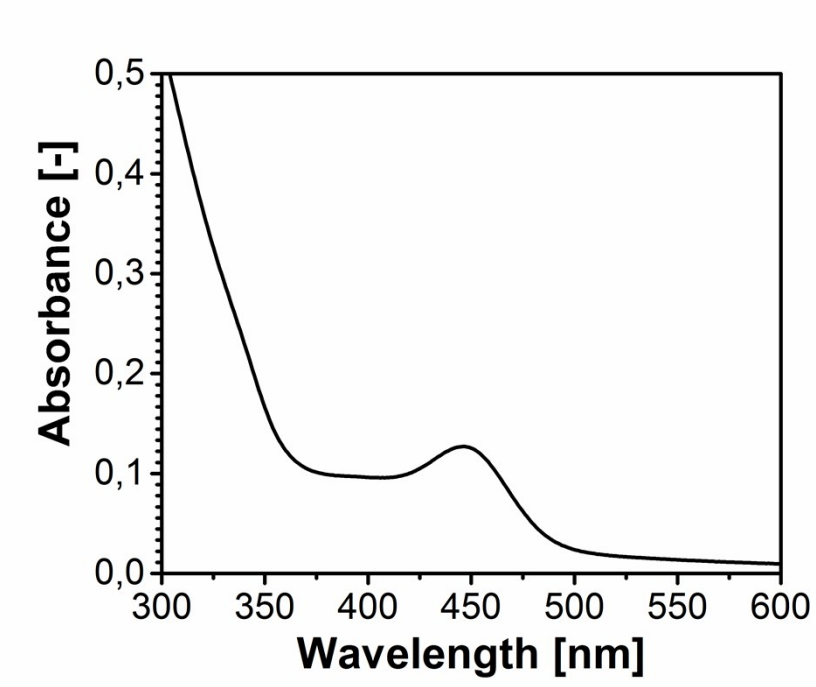

Fig. S7 UV-VIS spectrum of 15% colloidal solution of YAG:Ce (0,4 at%) prepared with DEG as co-solvent and dehydrated precursors.

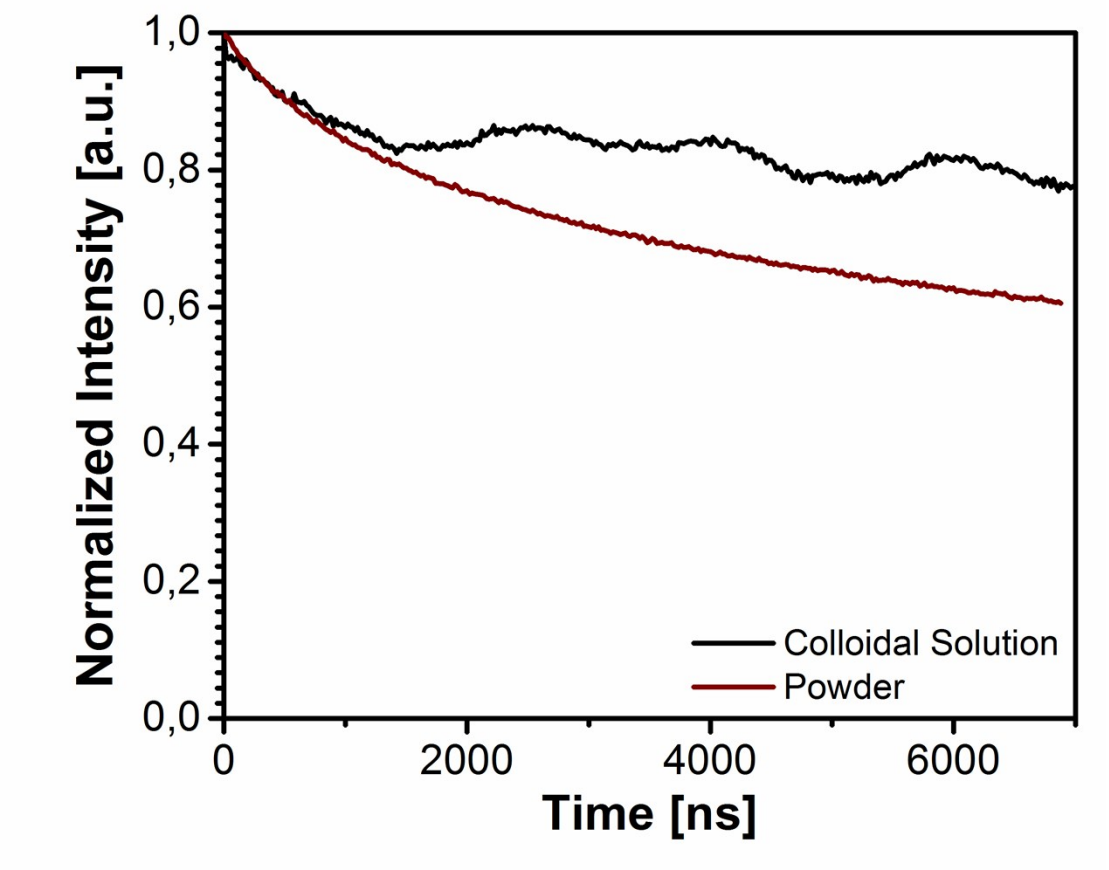

Fig. S8 Photostability of YAG:Ce (0,4% Ce) in the form of powder and as obtained colloidal solution (5% wt.)