Electronic Supplementary Material (ESI) for RSC Advances

Cyclodextrin cavity size induced formation of superstructures with embedded gold nanoclusters

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Aggregation of the Cyclodextrin Surrounded L-cysteine Coated Au NCs Studied by TGA

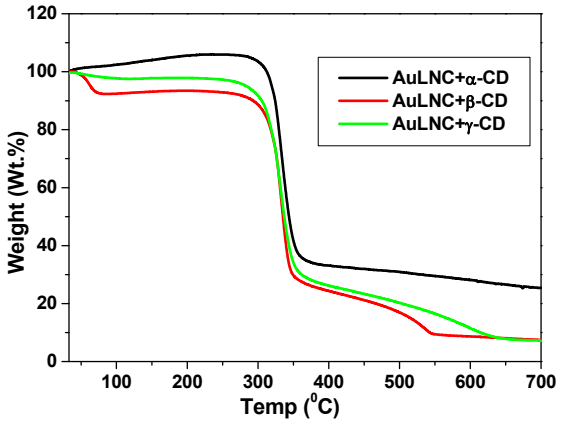

Fig. S1. Loss of mass of the aggregates of CD coated L-cysteine protected Au NCs.

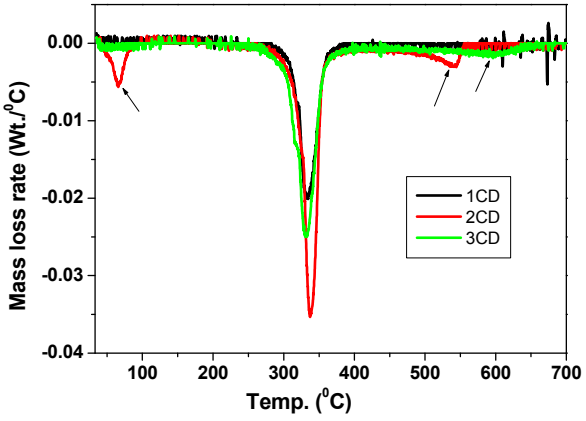

Fig. S2. Derivative curves of the TGA data for the three CDs coating the L-cysteine coated Au NCs. 1, 2, and 3 signify α-, β-, and γ-, respectively.

The mass loss in the temperature range 40 to 130^{o}C in the thermo gravimetric analysis (Fig. S1) is due to the loss of water molecules from the complex.[1] This water mass loss is observed more for the aggregated β-CD-Au NCs than γ-CD counterpart. The α-CD-Au NCs form spherical aggregates, which are more close-packed, so loss of water mass in the above temperature range is almost negligible. Mass loss in the higher temperature is for the decomposition of CD structural aggregates. This behaviour is seen to be different for the three CDs. For α-CD there is a one-step mass loss, but for the β- and γ-CD aggregates the mass loss occurs in three steps. The mass loss occurred in the third step for β- and γ-CD aggregates are occurring at different temperatures. Thus, the difference in the three types of CD aggregates with the L-cysteine coated Au NCs embedded inside signifies their different nature. To understand the changes at different temperatures, the derivative plots for the three CDs are also provided (Fig. S2).

Reference

1 G. Horvath, T. Premkumar, A. Boztas, E. Lee, S. Jon and K. E. Geckeler, *Mol. Pharmaceut.*, 2008, **5**, 358.