**Supplementary Information**

**Single excited dual band luminescent hybrid carbon dots-terbium chelate nanothermometer**

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**Figure S1.** Image of CDs dispersion in water (C=10 μg mL-1).



**Figure S2.** Luminescence intensity of [TbL]+ (lem=547 nm) versus temperature during heating-cooling-heating cycle in DMF (СL =СTb =1⋅10-4 M).



**Figure S3.** pH-dependency of CDs (lem=450 nm, C=0.01 g/L) in physiological range of pH=4.5-8.0.



**Figure S4.** Tentative Jablonski diagram showing photophysical processes responsible for generation of dual band emission of PSS-{CDs-[TbL]} colloids.

**Table S1.** Luinescence decay exponential deconvolution data and lifetimes of [TbL]+at different CDs to [TbL]+ ratio in DMF (CCD=0.09-3.15 mg⋅L-1; C[TbL]=0.45 mM).

|  |  |  |  |
| --- | --- | --- | --- |
| Molar quivalents of CDs | y0 | A1 | , ms |
| 0,2 | 2,057 | 1495,2 | 0,896 |
| 0,4 | 2,076 | 1409,4 | 0,914 |
| 0,6 | 2,447 | 1449,8 | 0,920 |
| 0,8 | 2,258 | 1568,7 | 0,932 |
| 1 | 2,159 | 1560,3 | 0,964 |
| 1,2 | 2,302 | 1552,3 | 0,968 |
| 1,4 | 2,263 | 1507,7 | 0,974 |
| 1,6 | 2,416 | 1500,8 | 0,976 |
| 1,8 | 2,731 | 1566,7 | 0,989 |
| 2 | 2,999 | 1571,7 | 0,980 |
| 3 | 2,729 | 1474,6 | 1,016 |
| 4 | 3,202 | 1499,5 | 1,032 |
| 5 | 2,922 | 1499,9 | 1,048 |
| 7 | 3,102 | 1511,1 | 1,072 |

**Table S2.** Average lifetimes of Tb(III) excited state for PSS-{CDs-[TbL]} colloids obtained according to *Synthesis\_1* and *Synthesis\_2* in water.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | A1 | t1 | A2 | t2 | tavg, ms | Adj. R-Square |
| *Synthesis\_1* | 1.282 | 0.068 | 0.321 | 0.305 | 0.193 | 0.99704 |
| *Synthesis\_2* | 1.161 | 0.087 | 0.356 | 0.309 | 0.203 | 0.99985 |



**Figure S5.** Chromaticity diagram for PSS-{CDs-[TbL]} (*Synthesis\_1*) (lex =360 nm) as a function of temperature over the 25-70°C range.