Supplementary data

Novel synthesis of slightly fluorinated graphene quantum dots with luminescent and paramagnetic properties through thermal cutting of fluorinated graphene

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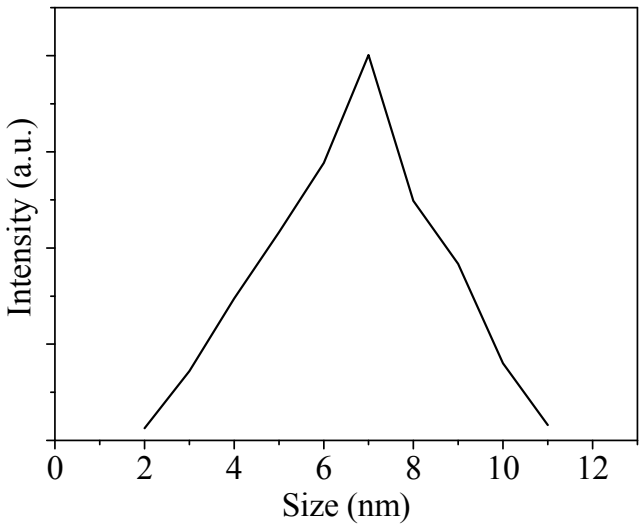

Figure S1. The size distribution of QGDs-F extracted by analysis of DLS data.

The corresponding DLS result provides further demonstration of small and relatively uniform sizes of the resultant QGDs-F (average hydrodynamic diameter ~6.64 nm), as is shown in Fig. S1.

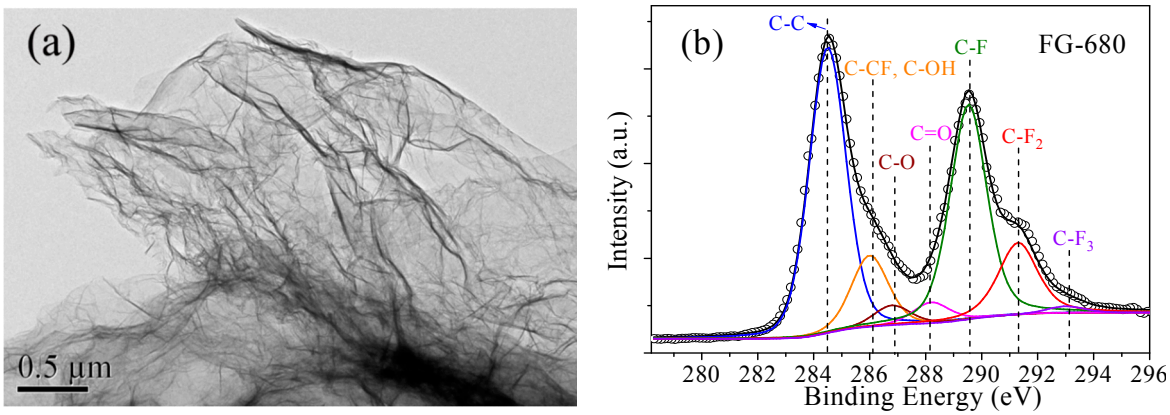

Figure S2. The typical TEM images and C 1s XPS spectra of FG-680.

Figure S2 gives the typical TEM images, and C 1s XPS spectra of FG-680. Different from that of FG-780 and FG-810, it is seen that the sample FG-680 maintain the two-dimensional flexible structure with many wrinkles. It is seen that the C 1s spectrum of FG-680 was deconvoluted into several components, and there are still residual CF_n (n=2, 3) of 13.0%, indicating that not all CF_n groups of FG detached from graphene skeleton. Hench, FG didn't thermally decompose into scattered grahene quantum dots at 680 K. The carbon loss calculated from C atomic percents and the residual mass of FG-680 is 20.7 %, which is larger than the drop of CF_n (n=2, 3) bonds (19.3%). It can be reasonably speculated that the defluorinated sample FG-680 has many structure defects, and the loss of skelton C atoms is because of not only the preferable break of CF-CF_n (n=2, 3) bonds to CFn fragments, but also the producing of some new C vacancies on the basal graphene plane.