Supplementary Material (ESI) for Journal of Materials Chemistry

Supplementary information:

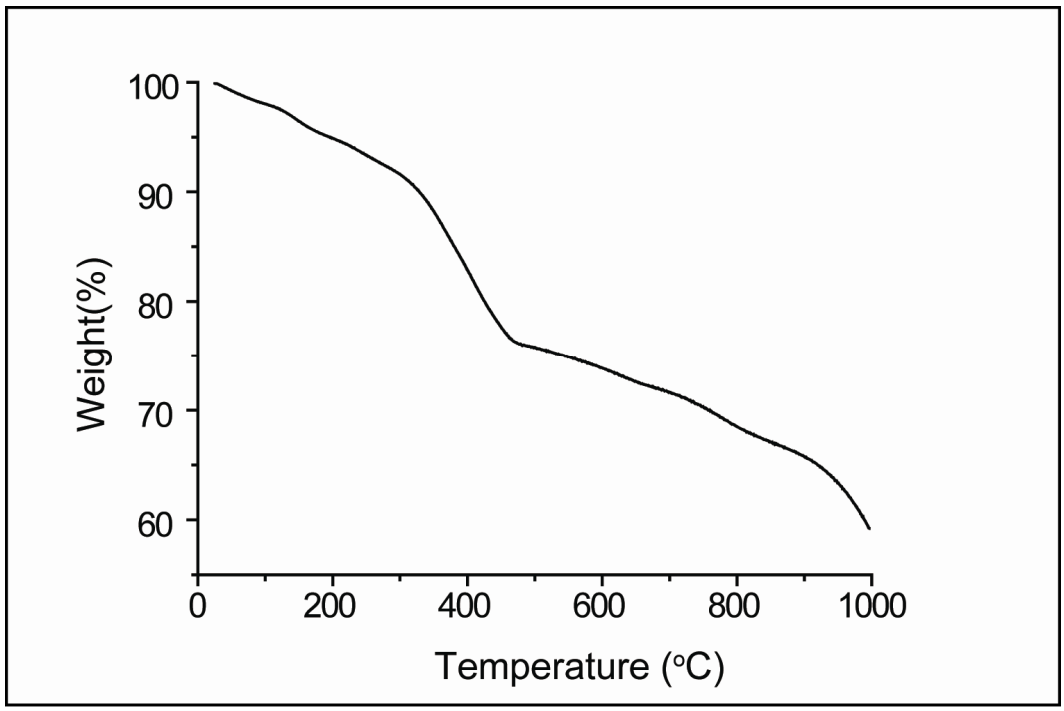
Long Aliphatic Chain Coated Rare-earth Nanocrystal as Polymer-Based Optical Waveguide Amplifiers

Ka-Long Lei[a], Cheuk-Fai Chow[ab], Kwok-Chu Tsang[c], Elva N. Y. Lei[b], V.A.L. Roy*[a], Michael H. W. Lam[b], C. S. Lee[a], E. Y. B. Pun[c]

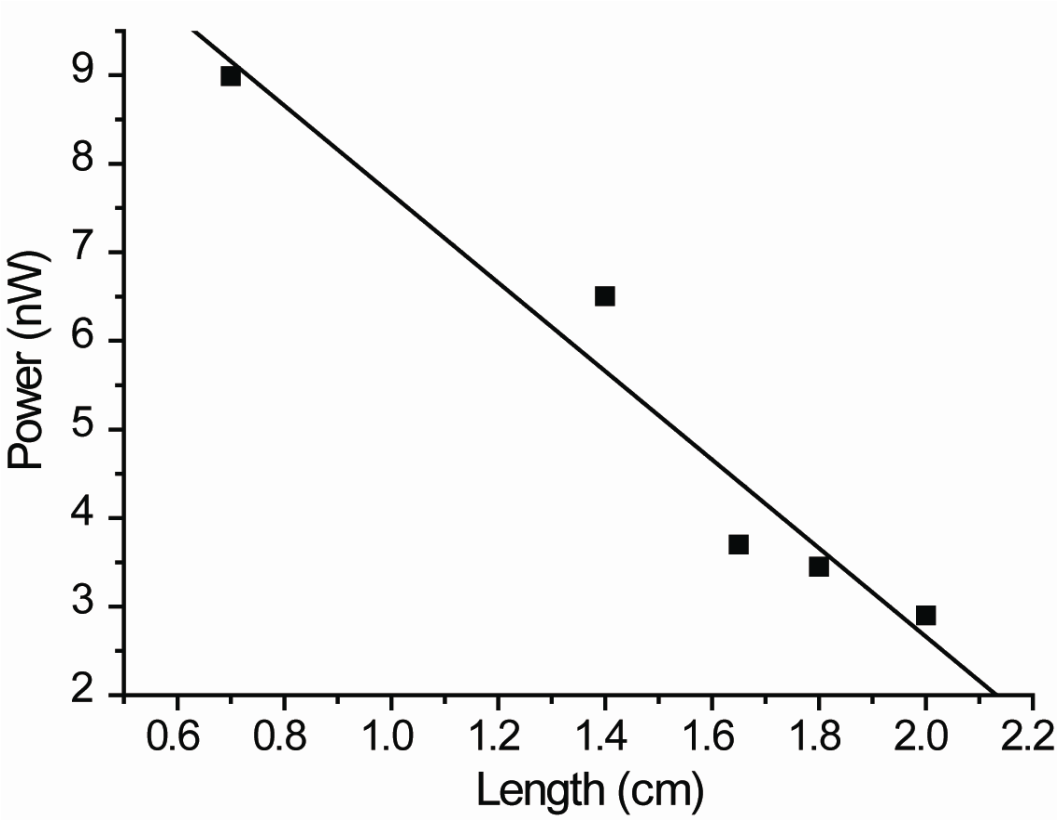
[a] Department of Physics and Materials Science, City University of Hong Kong, 83 Tat Chee Ave., H.K. SAR, China. Fax: (+852) 27887406; Tel: (+852) 21942729; E-mail: val.roy@cityu.edu.hk

[b] Department of Biology & Chemistry, City University of Hong Kong, 83 Tat Chee Ave., H.K. SAR, China.

[c]Department of Electronic Engineering, City University of Hong Kong, 83 Tat Chee Ave., Hong Kong SAR, China.



S.Figure 1. TGA curve of the oleic acid coated $NaY_{78\%}F_4:Yb_{20\%}Er_{2\%}$ nanocrystals.



S.Figure 2. Propagation loss of the nanocubes doped waveguide measured in 1535 nm. Note that the propagation loss was found to be ~3.4 dB/cm at 1535nm wavelength. The propagation loss is calculated from the linear plot as $[1/(L_1 - L_0)]$ x$[10 \log (P_0/P_1)]$ dB, where L is the length of the waveguide; P is the signal power.

S.Table 1 – Refractive index measurement

	1535nm	633nm	473nm
Undoped KMPR	1.548	1.566	1.583
0.1 wt% the nanocrystal doped KMPR	1.548	1.566	1.583