Supplementary Material (ESI) for Journal of Materials Chemistry


# Supporting Information for:

# "Distribution and Orientation Study of Dyes Intercalated into Single Sepiolite Fibers. A Confocal Fluorescence Microscopy Approach"

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**Fig. S1.** Typical intensity profiles for dye/Sep particles: (A) along the main C-axis and (B) along the short b-axis.

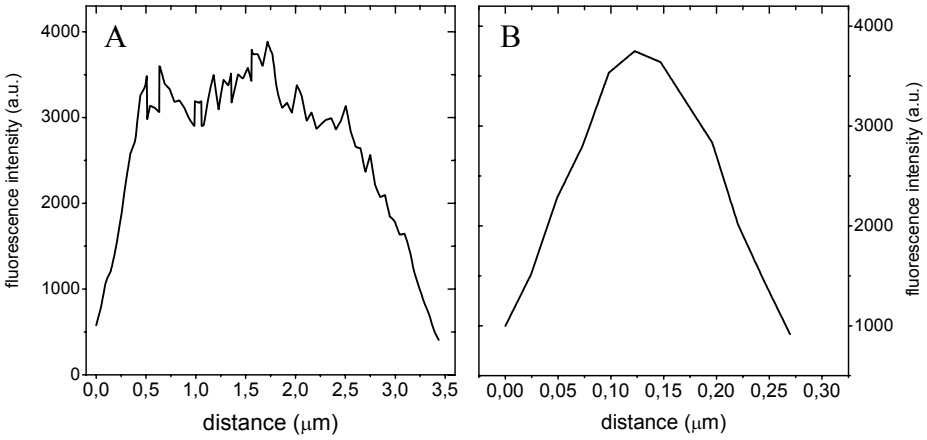


**Fig. S2**. Polarized intensity fluorescence images of 50% CEC R6G/Sep fiber. Arrows indicates the direction of polarization registered in each detection channel.

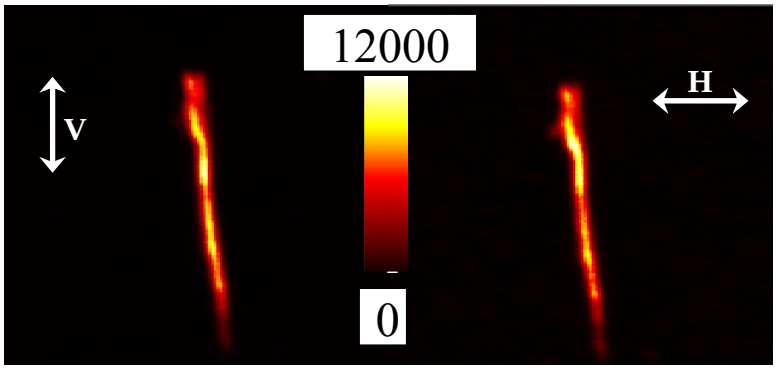

**Fig. S3**. (A) FLIM image of a single Sepiolite fiber dopped wih LDS 698; (B) Fluorescence decay curve of the dye/Sep fiber (inset: residuals); (C) Histogram of the fitted lifetimes.

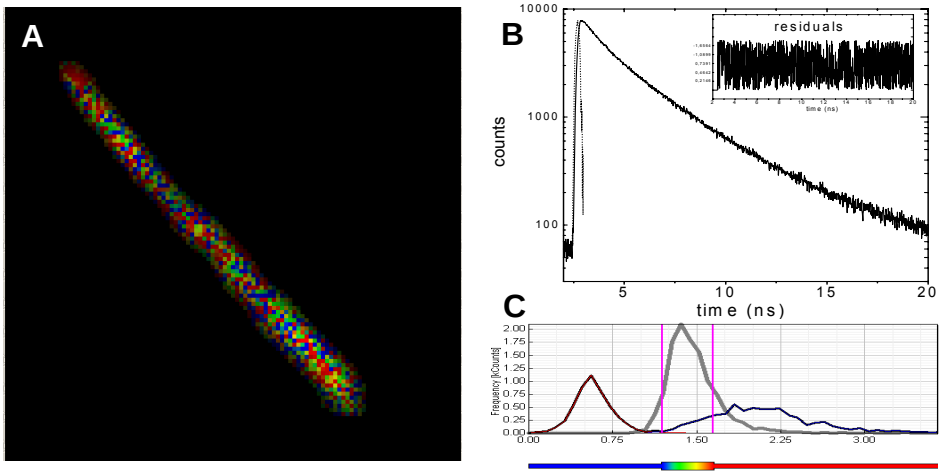


**Fig. S4.** Absorption and fluorescence spectra of LDS 698 (green) and LDS 722 (blue) in ethanol; solid lines indicates diluted dye solutions (C= $10^{-6}$ M) measured with cuvettes of 1 cm of optical path) and dashed lines concentrated dye solutions (C = $10^{-3}$ M) measured in cuvettes with 0.001 cm of optical path)

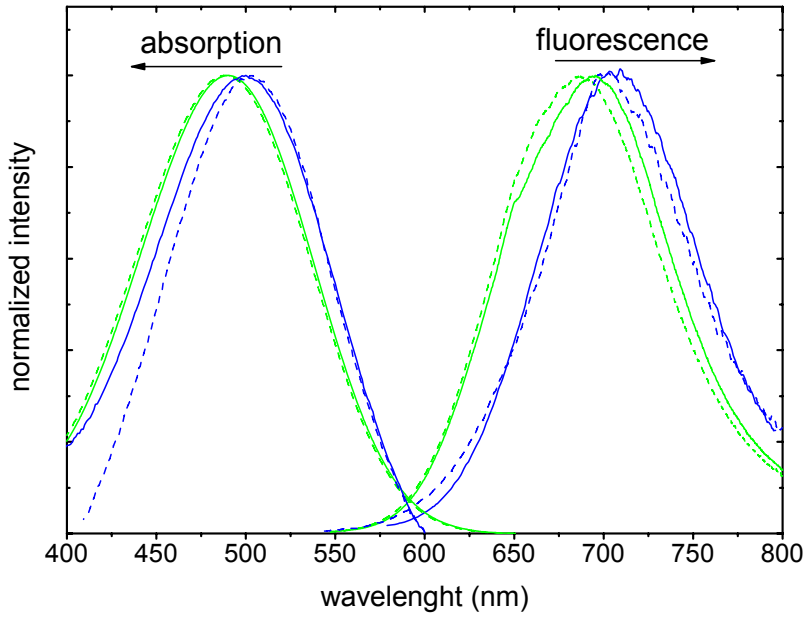

**Fig. S5**. (A) Fluorescence spectra and (B) Fluorescence decay curves of LDS 698 in ethanol (red) and in HEMA polymer matrix(Hydroxyethylmethacrylate).

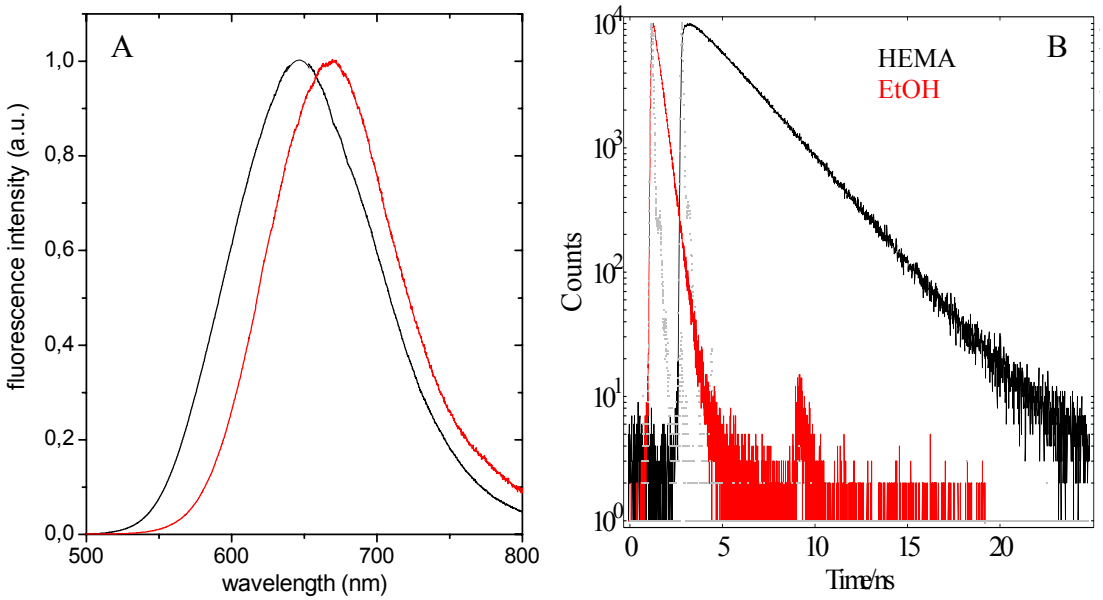


**Table S1:** Spectroscopic data of LDS 698 and LDS 722 in ethanol and embedded in the matrix of HEMA (Hydroxyethylmethacrylate) polymer.

| | $\lambda_{ab}$(nm) | $\varepsilon_{max}$ ($10^4 M^{-1}cm^{-1}$) | $\lambda_{fl}$ (nm) | $\phi$ | $\tau$ (ns) |
|---|---|---|---|---|---|
| **LDS698** | 490.5 | 3.1 | 670.0 | 0.093 | 0.36 |
| **LDS698/*HEMA*** | 486.5 | 2.7 | 647.0 | 0.22 | 2.67 |
| **LDS722** | 504.5 | 3.3 | 695.0 | 0.14 | 0.58 |
| **LDS722/*HEMA*** | 507.5 | 2.3 | 665.0 | 0.35 | 2.54 |

**Fig. S6.** Fluorescence decay curves registered in both detectors: parallel (black) and perpendicular (red) with respect to the long axis of LDS 698/Sep fiber. Dichroic ratio, D = $I_{\parallel}$ / $I_{\perp}$, analyzed at different time windows; markers corresponds to the part of the decay fitted for short and long lifetime of the LDS 698 adsorbed in Sep.

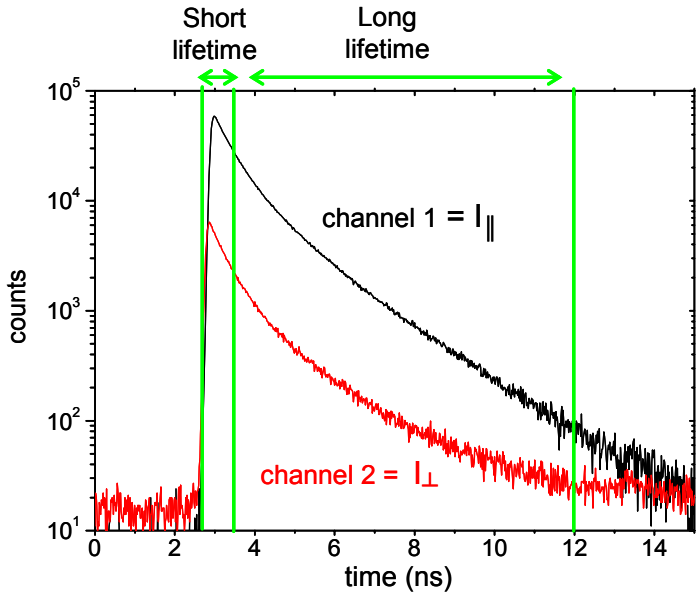


**Fig. S7.** FLIM image of LDS722/Sep 130% CEC together with the histogram of lifetimes.

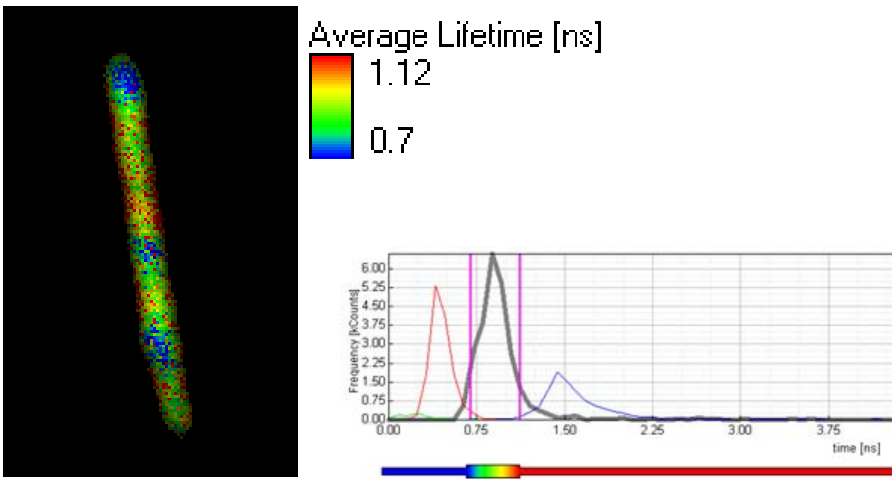

**Fig. S8**. Emission spectra of LDS 722 in solution (black line) and LDS 722 in single Sepiolite particle (red), measure in the same conditions in a Fluorescence Confocal Microscope by a spectrograph and a CCD camera mounted in a side port.

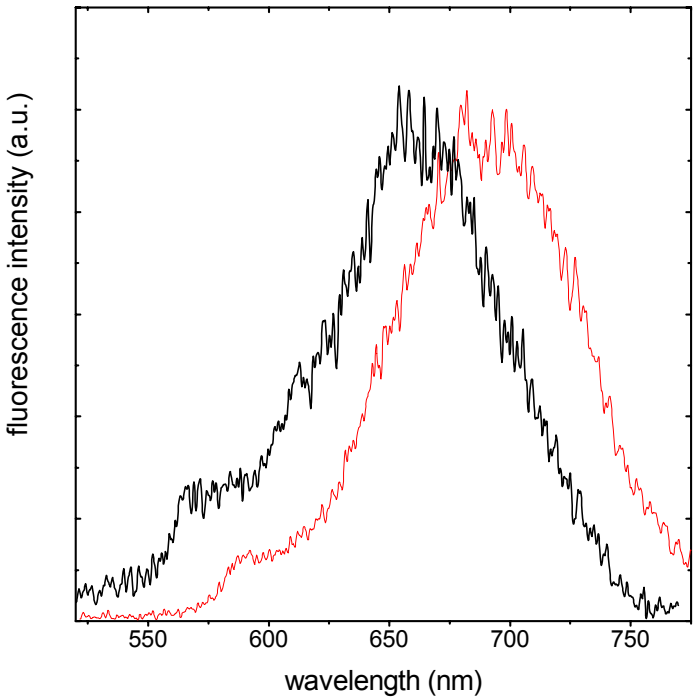


**Fig. S9**. FLIM image (left) of 6% CEC PY/Sep; Fluorescence decay curve along the particle (top right) and histogram of lifetimes (bottom right)