Supplementary Material (ESI) for Chemical Communications
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Supporting Infromation:

Hierarchical Tuning of 1-D Macro Morphology by Changing the Composition of a Binary Hydrogel and Its Influence on Photoluminescence Property

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Experimental Section:

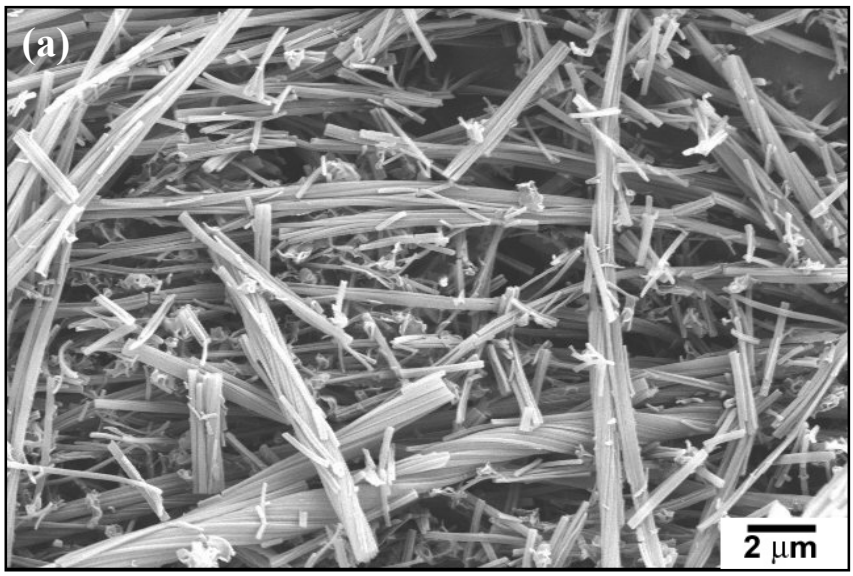
A. Materials and Methods: (-)- Riboflavin (R) and Melamine (M) were purchased from Aldrich Chemical Co., USA. Mixtures of riboflavin and melamine in different mole ratios (e. g., 4:1, 3:1, 2:1, 1:1, 1:2, 1:3) were taken in glass tubes and water was added to make the total complex concentration 0.2% (w/v). It was then sealed, and heated to 120^0C to solubilize the components homogeneously and quenched to room temperature to have a yellow colored gel. Then the gels were frozen dried to get dried gels.

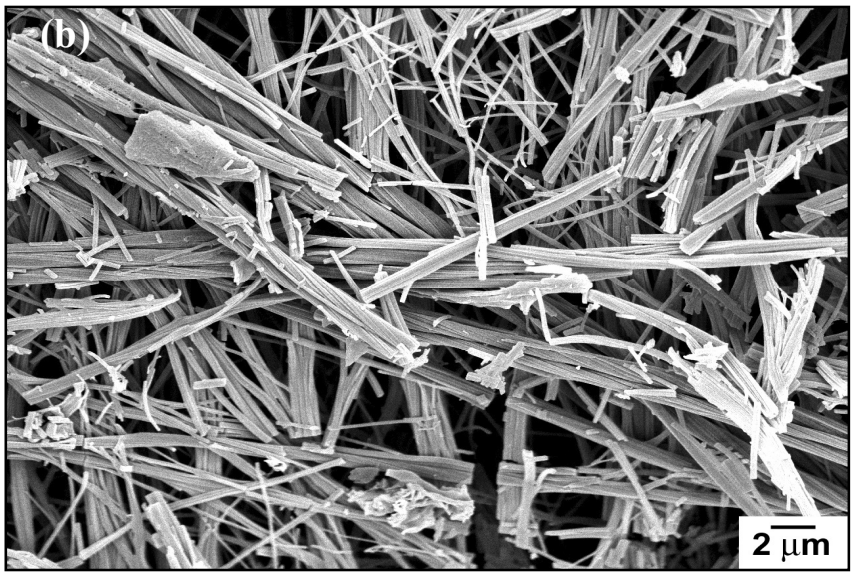
B. Field Emission Scanning Electron Microscopy (FESEM): To understand the morphology of the gel small portions of the hydrogels of different RM compositions, produced at 30^0C, were placed on glass cover slip. They were dried in air at room temperature, finally in vacuum at 30^0C and then they were observed through a FESEM instrument (JEOL, JSM 6700F) operating at 5 KV.

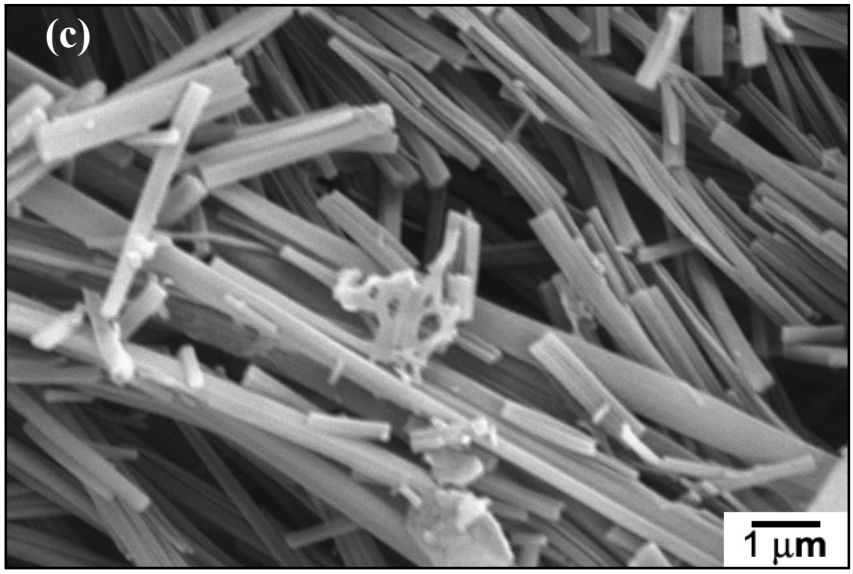
C. Atomic Force Microscopy. The morphology of the RM31xerogel was studied using atomic force microscopy (Veeco, model AP0100). The AFM study was conducted in noncontact mode at a tip resonance frequency of 300 kHz. The sample was cast on a glass slide and the pictures were taken in amplitude mode.

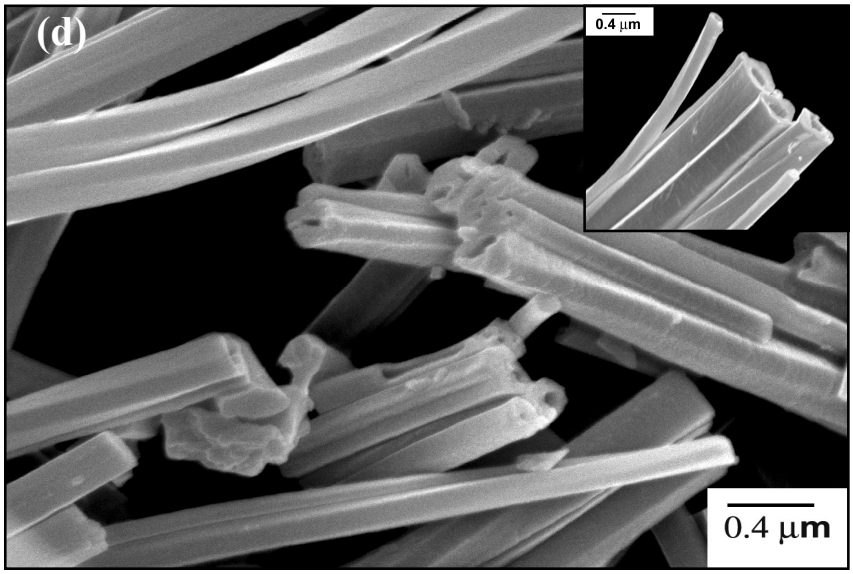
D. Photoluminescence Spectroscopy: Fluorescence studies of RM hydrogel samples, prepared in a sealed cuvette, were made in a Horiba Jobin Yvon Fluoromax 3 instrument. The gel samples were taken in a Quartz cell of path length one cm and were excited at 365 nm. The emission scans were taken from 400 nm to 800 nm using slit width 2 nm with an increment of wavelength 1 nm having integration time 0.5 second. For the dried gels the same amount of solid sample was taken in a quartz holder and the spectra was taken as above.

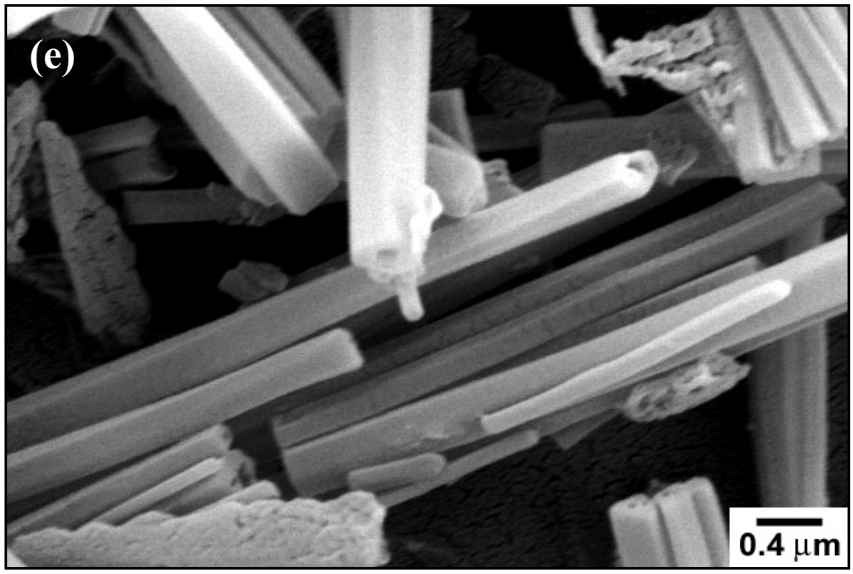
Supplementary Figure 1: FESEM images of xerogels of 0.2% w/v hydrogels of (a) RM41, (b) RM31, (c) RM21, (d) RM11, (e) RM12 and (f) RM13 (inset of figure 1(d): bunch of tubes obtained from RM11 xerogel)

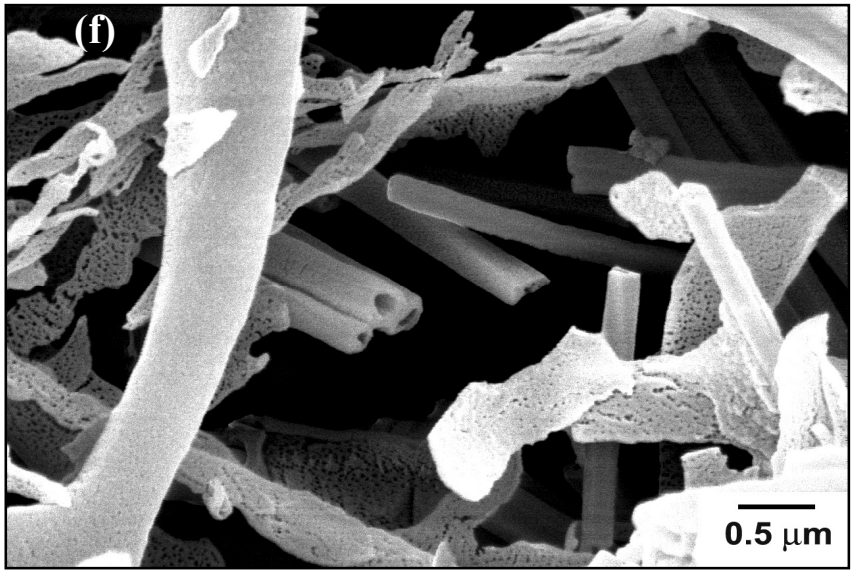




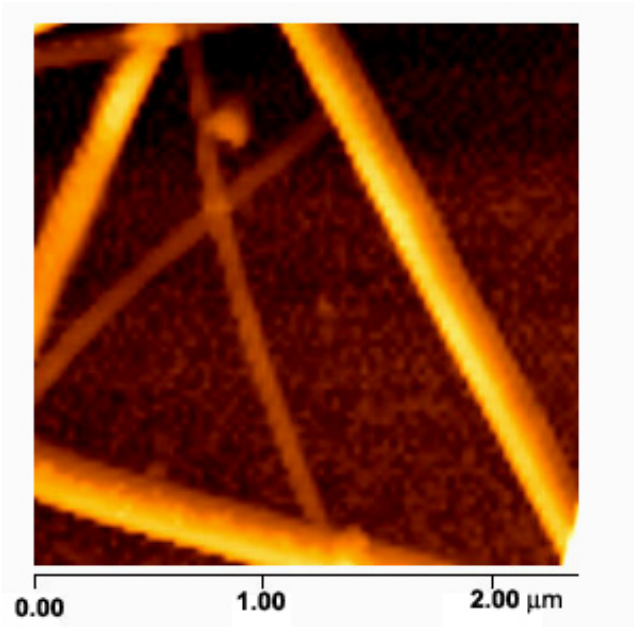

(c)
1 μm

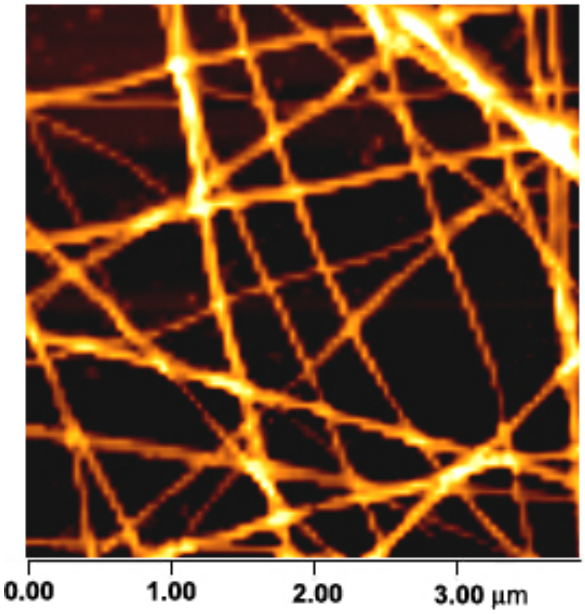

(d)
0.4 μm
0.4 μm


(e)
0.4 μm

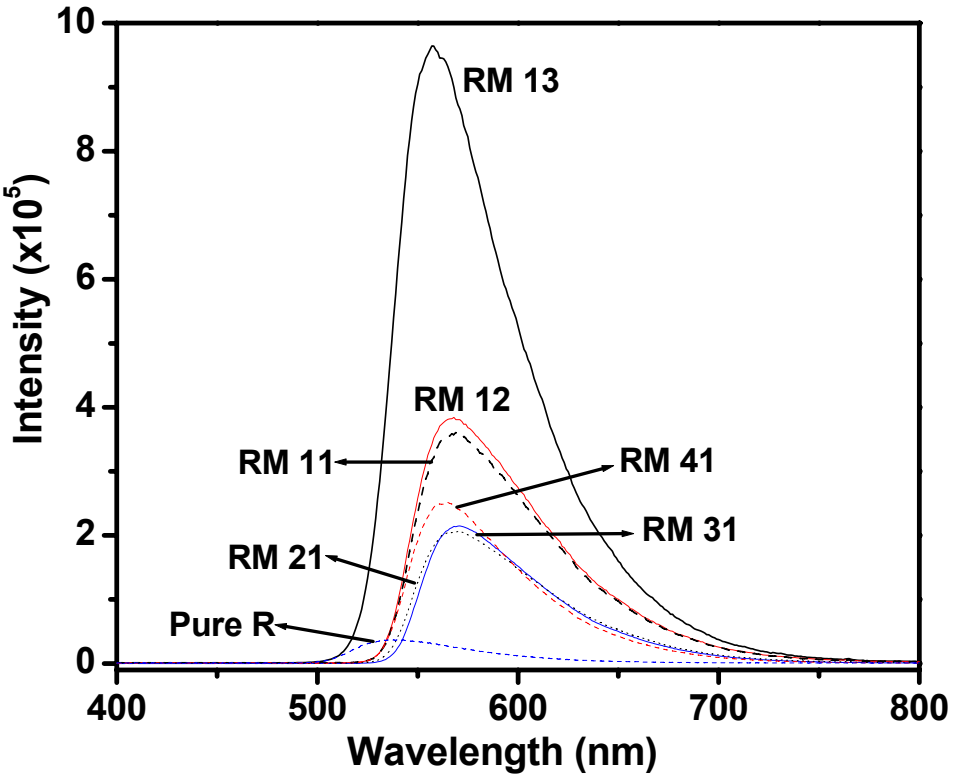

(f)
0.5 μm

Supplementary Figure 2: AFM images of RM31 xerogel of 0.09% (w/v) hydrogel.

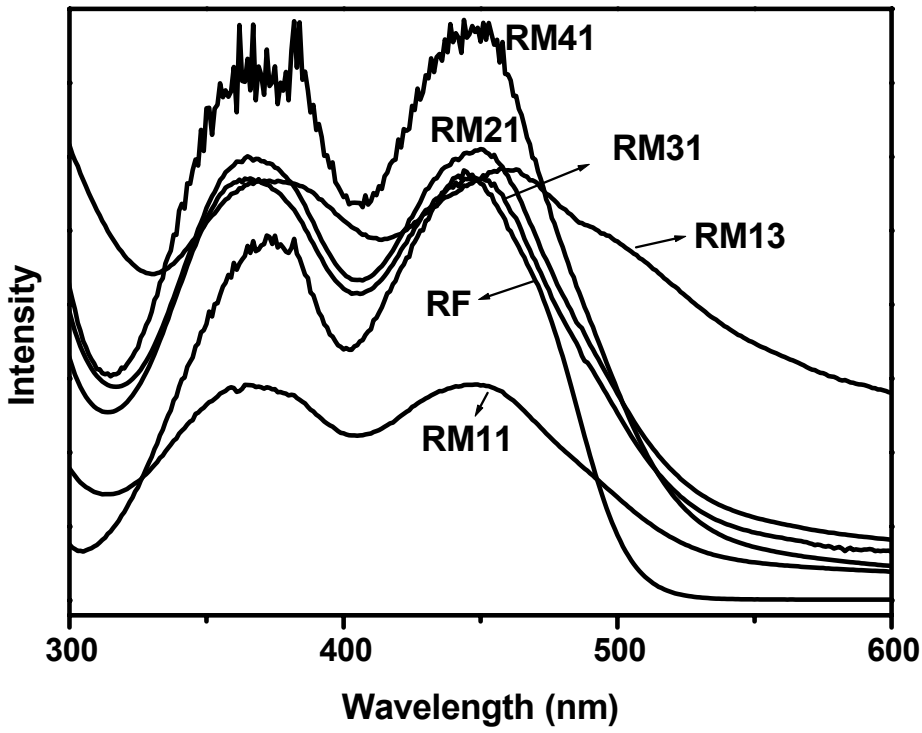
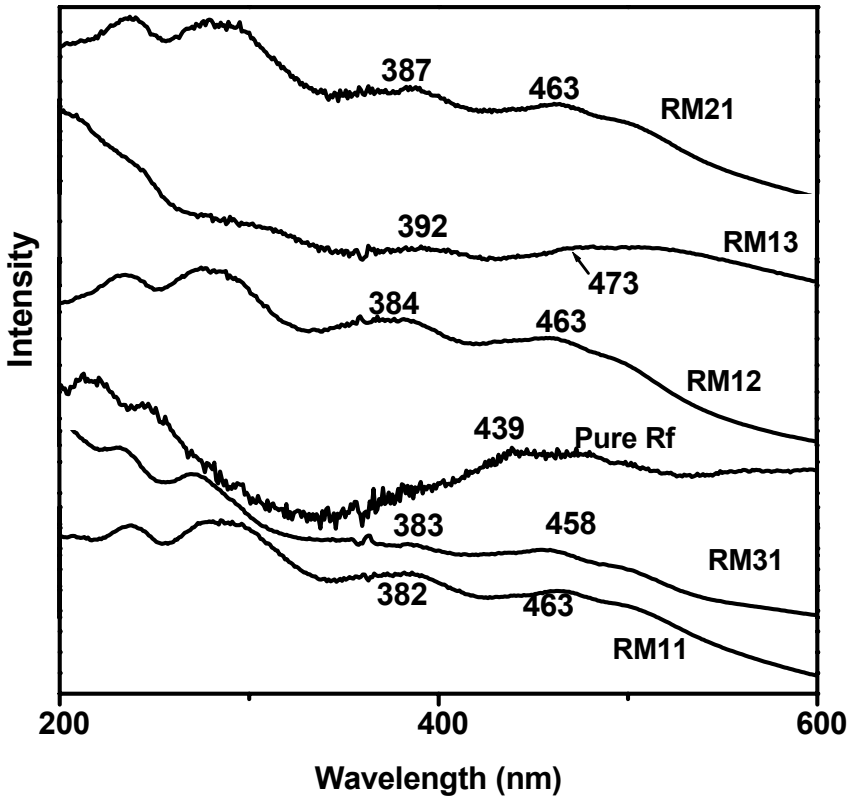




Supplementary Figure 3: Plot of fluorescent Intensity (normalized to same riboflavin concentration) vs. wavelength for different 0.2 % (w/v) hydrogels.



Supplementary Figure 4: UV-Vis spectra at 30^0 C of different RM hydrogels of concentration of 0.09% (w/v).



Supplementary Figure 5: UV-Vis spectra of different RM xerogels derived from 0.09 % (w/v) hydrogels.