Supporting information



Figure S1 TEM image of the mesoporous nano-fibres bundles prepared prepared at

303 K in the presence of decane



Figure S2 N₂ adsorption-desorption isotherms of the mesoporous silica nano-fibres bundles prepared at 303 K. Inset is BJH pore diameter distribution calculated from the adsorption branch. The nano-fibres bundles show an H₁ hysteresis loop at the relative pressure of ca. 0.8, which is a typical isotherm of mesoporous materials. Furthermore, another steep increase occurred at the relative pressure larger than 0.9. It could be attributed to the N₂ adsorption in the interparticle spaces (T. R. Pauly, Y. Liu, T. J. Pinnavaia, S. J. L. Billinge and T. P. Rieker, *J. Am. Chem. Soc.*, 1999, **121**, 8835; K. Suzuki, K. Ikari and H. Imai, *J. Am. Chem. Soc.*, 2004, **126**, 462), which are built up by the aggregation of the nano-fibres. The BJH pore size distribution of the mesoporous silica nano-fibres calculated from the adsorption branch (inset) shows a sharp peak centred at 12 nm, which is the diameter of the cylindrical mesopores and agrees with the results of the TEM image (Figure S1). Other larger-pore peaks could be attributed to N₂ adsorption in the interparticle voids associated with the co-aligned superstructure of mesoporous nano-fibres bundles.



Figure S3 Powder SAXD pattern of the hierarchically ordered mesoporous silica nano-fibres



Figure S4 N₂ adsorption-desorption isotherms of the MLVs prepared at 313 K. The MLVs give an H₃ hysteresis loop that could be assigned to the N₂ filling in the slit-shaped pores (F. Rojas, I. Kornhauser, C. Felipe, J. M. Esparza, S. Cordero, A. Dominguez and J. L. Riccardo, *Phys. Chem. Chem. Phys.*, 2002, **4**, 2346), consistent with the TEM observation.



Figure S5 N_2 adsorption-desorption isotherms of the MCFs prepared at 333 K in the presence of decane, inset is pore diameter distribution calculated from adsorption and desorption branches respectively.



Figure S6 Random-aligned mesoporous nanofilaments prepared in the presence of

nonane