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Title:	Columnar self-assembly of luminescent bent-shaped hexacatenars with a central pyridine core connected with substituted 1,3,4-oxadiazole and thiadiazoles
Authors:	De, J. (/jspui/browse?type=author&value=De%2C+J.) Pal, S.K. (/jspui/browse?type=author&value=Pal%2C+S.K.)
Keywords:	Thiadiazole derivative Pyridine Hydrogen bond Bent-shaped hexacatenars
Issue Date:	2018
Publisher:	Royal Society of Chemistry
Citation:	New Journal of Chemistry, 42(5), pp. 3781-3798
Abstract:	Bent-shaped molecules with a central pyridine core flanked with substituted 1,3,4-oxadiazole and thiadiazole derivatives with a variation in the number and length of terminal tails were synthesized. Thiadiazole based compounds exhibited a wider mesophase range in comparison to oxadiazole derivatives, while the oxadiazole derivatives exhibited a higher gelation tendency. All hexacatenars exhibited supragelation in hydrocarbon solvents along with an ability to form self-standing, moldable gel at higher concentration. Thiadiazole based compounds exhibited bathochromic absorption and emission in comparison to oxadiazole derivatives but a lower quantum yield. Two of the gelators investigated exhibited aggregation induced enhanced emission in gel and thin film state. This study shows that in addition to π - π interactions, nanosegregation of incompatible molecular subunits like flexible tails plays a major role in gelation and liquid crystalline self-assembly. Microscopic studies and X-ray diffraction studies revealed a fibrillar network of several micrometers in length with long range molecular self-assembly. They showed the ability to sense acids with an emission quenching/shifting mechanism, which makes it possible to detect the acids by naked eye. Considering the dearth of solid-state organic blue light emitters that are pivotal to realize the white light emission, these polycatenars are promising due to their wide-range Col phase and aggregation induced blue emission. Further the introduction of the pyridine central unit enhanced the mesophase stability and the acid sensing functionality in comparison to simple benzene-based bent-shaped polycatenars.
Description:	Only IISERM authors are available in the record.
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