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Gelation of self-assembed bile acid-PEG conjugates
SATU STRANDMAN, FRANTZ LE DEVEDEC, X.X. ZHU[1], University of Montreal — The aggregation of macromolecules and low-molar-mass compounds into elongated self-assemblies such as wormlike micelles, fibers, or tubules increases the viscosity of the solutions and often leads to gelation due to network formation, even in organic solvents. Such one-dimensional nanostructures are promising candidates for drug delivery vehicles, packing materials for separation, templates for metal nanowires, biocides, and photo- or biocatalysis. An interesting group of compounds capable of this type of self-organization are bile acids, which are endogeneous steroids known to form gels at high concentrations and appropriate pH conditions. Grafting poly(ethylene oxide) on bile acids via anionic polymerization brings along thermoresponsiveness represented by lower critical solution temperature (LCST), while self-assembling occurs below another threshold temperature leading to a gelation at high concentrations, as shown by rheological experiments. The latter transition is assigned to the nanotube formation of pegylated bile acids, visualized by electron microscopy.

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