

New photo-sensitive polyoxazoline - Water sorption behavior dependent-sensitive groups

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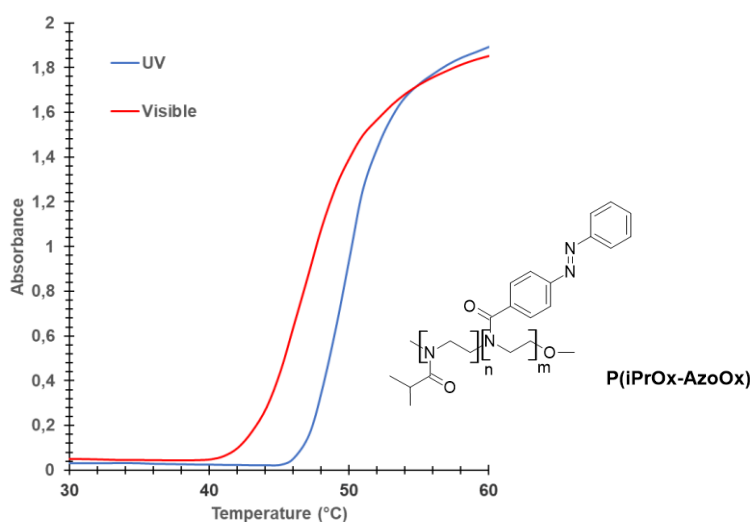
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Stimuli responsive porous membranes are promising for the elaboration of dynamic systems allowing the control on-demand of the pore size. Such “valve-effect” phenomenon allows to control and to regulate the selectivity and the rate of molecules passing through the membrane. The usual stimuli used to elaborate such membrane are pH¹, temperature² and light³. Thermo-sensitive membranes were largely studied and show good results⁴. However, a soft, fast and localized trigger such as light is of a great interest to finely tune the permeability of the membrane. To keep the advantage of thermally controlled valve effect membranes, we choose to control with the light the cloud point temperature of a thermo-sensitive polymer.

For that purpose, we synthesized a new oxazoline monomer with a photo-sensitive group. This monomer was then copolymerized with 2-isopropyl-2-oxazoline to obtain a thermo- and photo-sensitive copolymer. A range of copolymer with different ratio of the photo-sensitive group was synthesized. We demonstrated that the cloud temperature shifts under UV and light irradiation. Thermal properties were investigated and the impact of the photo-sensitive groups on the water sorption capacity of the copolymer was clearly observed.



References

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