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Formation of Hydrophobic Drug Nanoparticles via Ambient Solvent Evaporation Facilitated by Branched Diblock Copolymers

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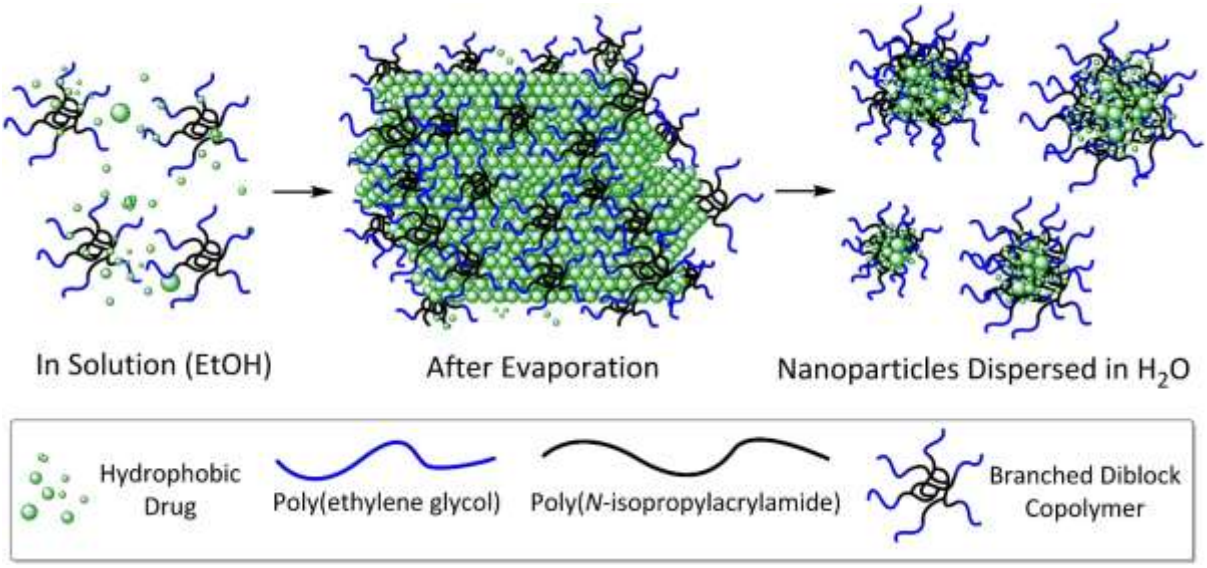
Graphical abstract



Abstract

Hydrophobic drug nanoparticles have been prepared by ambient solvent evaporation from ethanol at room temperature. Poly(ethylene glycol)-b-(*N*-isopropylacrylamide) (PEG-*b*-PNIPAm) branched diblock copolymers are employed to prevent drug crystallization during solvent evaporation and to stabilize the drug nanoparticles once suspended in aqueous media. After the initial solvent evaporation the dry materials obtained exhibit excellent stability during storage and can be readily dissolved in water to produce aqueous drug nanoparticles suspensions. Among the hydrophobic compounds investigated, Ketoprofen nanoparticles ($D_h \approx 200$ nm, stable up to 9 months in solution)