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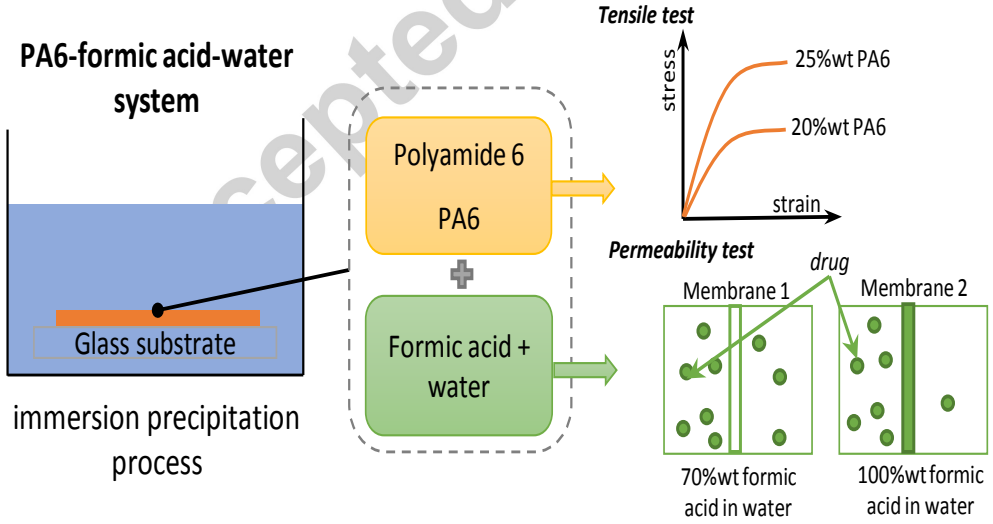
Abstract

The paper presents the effect of polymer solution composition on the morphology, mechanical properties and drug permeability of the asymmetric polyamide 6 (PA6) membranes prepared by immersion precipitation. The effect of polymer solution composition on morphology, mechanical properties and permeability of the produced membrane is considered, since these properties are of relevance for drug delivery applications. PA6-formic acid-deionized water solutions were used to prepare membranes for further characterization with differential scanning calorimetry and scanning electron microscopy for morphology analysis, tensile testing and drug permeability tests.

The results show that the amount of PA6 does not significantly affect morphology of the membrane, while having pronounced effect on tensile elastic modulus (50% increase). On the other hand, the concentration of formic acid in solution (dissolution intensity) influences crystallization dynamics and significantly changes the morphology of membrane (in the range of approximately 75% to 100%wt of formic acid concentrations), consequently having effect on drug permeability.

Graphical abstract



Keywords: polyamide 6; formic acid; immersion precipitation; tensile; drug permeability