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On the search of rigorous thermo-kinetic model for wet phase inversion technique

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Abstract

Polymeric membranes are usually fabricated by phase inversion process because the membrane morphology and its separation properties can be altered directly by the process conditions. The experimental study of this process and involved subsequent phenomenological events is almost impossible in many cases, mainly due to the fast rates of solvent/nonsolvent exchange and small thickness of cast polymeric film. Hence, many researchers have mathematically tried to develop predictive models. However, to establish a predictive model, an appropriate coupling of thermodynamic stability states of polymeric solution and the different possible involved kinetic mechanisms must be incorporated as investigated in the present work. Here, first, it has been shown that previous models had incorporated incorrect assumptions during model development and inconsistent form of governing equations for numerical calculations has been used which violates the conservative

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