

Accepted Manuscript

Title: Crystalline polymorphism in poly(vinylidene fluoride) membranes

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PII: S0079-6700(15)00090-8
DOI: <http://dx.doi.org/doi:10.1016/j.progpolymsci.2015.07.007>
Reference: JPPS 942

To appear in: *Progress in Polymer Science*

Please cite this article as: Cui Z, Hassankiadeh NT, Zhuang Y, Drioli E, Lee YM, Crystalline polymorphism in poly(vinylidene fluoride) membranes, *Progress in Polymer Science* (2015), <http://dx.doi.org/10.1016/j.progpolymsci.2015.07.007>

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Crystalline polymorphism in poly(vinylidene fluoride) membranes

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ABSTRACT

PVDF is widely employed in membrane processes. Its crystals have five different polymorphs, α , β , γ , δ , and ϵ forms. In the past decades, research has been focused on the properties and performances of PVDF membranes. However, the formation mechanisms of the various polymorphs and their different effects on membrane performance are still not clear. Therefore, overall clarification of, conclusions about, and outlook on the effects of PVDF polymorphism on membrane properties and performance are important topics for further research. This manuscript systematically summarizes the structures and properties of PVDF crystals with different polymorphs, discusses the mechanisms of formation and transformation methods, reviews the crystallization and applications of different PVDF polymorphs in membrane separation, and presents the outlook for applications in membrane operations.

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