

Natural ageing in polyvinyl alcohol films

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Abstract (Calibri 11)

We make a study on the differences that undergo the physicochemical properties of polymeric membranes of polyvinyl alcohol (PVA) stored for 10 years after they have been prepared. This in context of the special significance of this widely used polymeric material and especially for use of biomedical and pharmaceutical sciences.

The aim of this study is to evaluate the stability of thermal properties and the degree of interaction with water. Positively, we will use thermal analysis to determine the thermal parameters (crystallinity and Tg) of the polymer matrix and water absorption experiments to determine the degree of swelling and the percentage of dissolution. Events on the molecular level lead to change in the morphology and macroscopic physical properties

Comparison of the properties indicate that: Qualitatively, with age, it turns out that we have an increase in the value of Tg and a decrease in the percentage of crystallinity. Quantitatively, membranes in 2020 absorb less water and swell much less

In summary, we can say that after 10 years the material does not fully retain its physico-chemical properties, but we also do not have substantial changes as the membranes are partly amorphous and partly crystalline (only the ratio changes). Also the attitude towards water does not change much with time aging. PVA membranes are similar in appearance but less relaxing

References

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