

PVAI/ PVP/ CITRIC ACID HYDROGELS MEMBRANES FOR DRUG DELIVERY APPLICATIONS

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Abstract

Hydrogels are three-dimensional, cross-linked networks of water-soluble polymers. Hydrogels are made from water-soluble polymers, encompassing a wide range of chemical compositions and bulk physical properties. Furthermore, hydrogel can be formulated in a variety of physical forms, including slabs, microparticles, nanoparticles, coatings, and films. As a result, hydrogel are commonly used in clinical practice and experimental medicine for a range of applications, including tissue engineering and regenerative medicine, diagnostics, cellular immobilization separation of biomolecules or cells, and barrier materials to regulate biological adhesions. The characterization of hydrogel membranes was conducted on dried form. The dried hydrogel was analyzed by differential scanning calorimetry (DSC), thermogravimetry analysis (TGA), infrared spectroscopic analysis (FTIR), swelling and gel determinations.

The results in Figure 1a show the thermal degradation of membranes: PVAI pure begins decomposition at 273 °C and when crosslinked by citric acid this temperature increases at around 22 °C which means that the crosslinked membrane with 3.0% of citric acid presents higher thermal stability than the others membranes. The PVP degradation didn't show drastic changes.

In Figure 1b are reported the derivative thermogravimetry curves which corroborate with the increase in the thermal stability in the membranes showing displacement of the maximum temperature of decomposition.

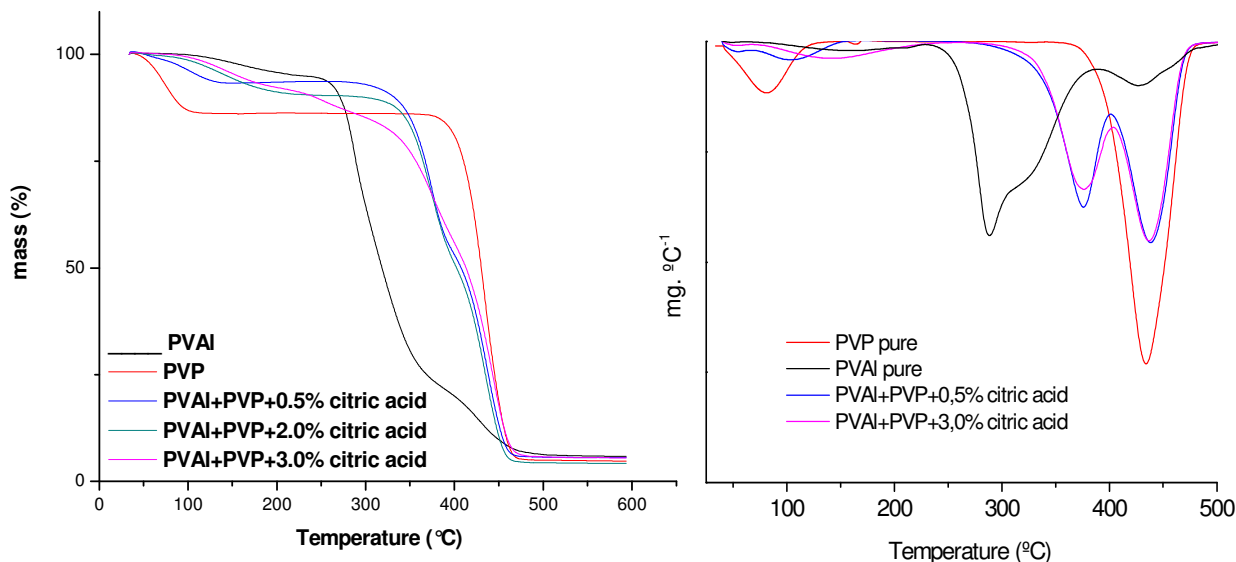


FIGURE 1 – Thermogravimetry results (1a) and Derivative thermogravimetry curves (1b) for the hydrogels.

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