CICLO DE SEMINARIOS 2010

SMAT-C Soft Matter Research and Technology Center

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"Structural Relaxation of Salmon Gelatin Films in the Glassy State"

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This study deals on the structural relaxation of gelatin from Atlantic salmon (Salmo salar). Molecular weight (Mw) was determined by capillary viscosimetry (CV). Films prepared by casting were aged isothermally in the glassy state. Glass transition temperature (Tg) was assessed by differential scanning calorimetry (DSC). The Young's modulus (E) of the films was determined in tension mode. The relaxation of E (φ) at constant temperature and moisture content was modeled by Kohlrausch-Wlliams-Watts (KWW) equation. The excess in enthalpy generated on storage was monitored by DSC.

VC produced Mw values similar to those reported in the literature for marine species. Mechanical data showed a spontaneous increase in E on storage probably due to matrix densification. The fitting of KWW equation on relaxation data produced an increase in relaxation time (τ) as the ageing time increased. β parameter was smaller for the aged films suggesting a less mobile matrix. The mechanical relaxation rate ($d\varphi/dt$) was faster in the fresh sample, decaying 90% before 100s. DSC showed an overshoot in heat capacity at Tg on the stored film, which was associated to an excess in enthalpy (ΔH) in the system moving to thermodynamic equilibrium.

These results indicate a relaxation phenomenon that occurs spontaneously on storage, producing significant changes in the physical properties of the material. Aspects with technological significance if salmon gelatin, an important by-product from industry, is used in low moisture environment (e.g. encapsulation).

MARTES 27 JULIO, 14:00 HORAS

Sala Conferencias, Tercer Piso – Departamento de Física
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