

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Drying of polymer films: study of demixing phenomena

JULIE FICHOT, RODOLPHE HEYD, CNRS, MARIE-LOUISE SABOUNGI, CHRISTOPHE JOSSEREND, EMILIE COMBARD, JEAN FRANCOIS TRANCHANT — Understanding the mechanisms that control the stability of polymeric films is important in beauty care. We have prepared films starting from a water-soluble organic polymer, a preservative and water. We study the drying of these films as a function of several physicochemical parameters that control their interfaces such as temperature, humidity and the nature of the support. The viscoelastic properties of the solutions before spreading out are analyzed with a rheometer in order to adjust the temperature. The topography of the films is observed by optical microscopy and the evolution of the drying is determined with a precision gravimetric balance. The behavior of the films on a nanometric scale is followed by AFM. During the drying process, droplets appear on the surface of the film, made up of water surrounded by a shell of preservative. As the films dries, the water evaporates from the droplets and the preservative spreads on the surface of the film, leading to the formation of craters on the surface of the dried film. The dimensions and numbers of the craters depend strongly on the type and concentration of the preservative employed.

David Price

Date submitted: 27 Dec 2010

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