

## MORPHOLOGY AND TRANSPORT IN POLYMER LATEX FILMS

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The permeability of latex films is important in potential controlled or sustained release applications as well as in barrier coatings. A range of permeation techniques have been used to study transport mechanisms across polymer latex films containing water soluble leachates. Films have been cast from "model colloid" latices, which are additive free, and from commercial latices which may contain endogenous surfactant or plasticizer essential for film formation. Deliberate additions of water soluble leachates including low molecular weight materials, polymeric materials and soluble latices were used to systematically modify, particularly solute, transport across the films.

The loading of additive which could usefully be retained within the film structure without exudations to the film surfaces depended upon compatibility. Different additives were leached at different rates during the permeation experiments depending upon the loadings.

The morphology of the films used has also been studied using tensile snap FFTEM (Freeze Fracture Transmission Electron Microscopy), scanning electron microscopy and mercury porosimetry whilst permeability data provided complementary evidence on film structure and in particular porosity. The ability to develop a continuous pore network across the film depended upon the additive type and the ability of the film to retain porosity on drying depended upon the  $T_g$  of the polymer involved.