



Contribution ID: 9

Type: **Talk (20 min + 5 min discussion)**

Interdiffusion of water in waterborne polymer latex films

Monday, 4 December 2023 14:05 (25 minutes)

Waterborne latex films, obtained from the dispersion of latex particles are of particular interest due to the non-content of volatile organic compounds (VOC), often mandatory under environmental legislation [1]. However, abrupt water penetration inside the films restricting their lifespan and deteriorating the shining of the coating. In order to prepare efficient and solvent-free coatings with the low glass-transition temperature ($T_g <$ the drying temperature) but with higher mechanical strength, we have integrated hydrophilic layers (Acrylic acid/ Poly(acrylamide)) around the hydrophobic cores (mixture of Methyl methacrylate and Butyl acrylate) in the latex film. Latex particles with different morphology (hairy layer variants and core-shell particles) have been synthesized using emulsion polymerization. Polymer latex films have been prepared in the next step by evaporating water in a climate chamber at temperature 25 °C. The structure formation of polymer latex films in the dry state (crystallinity) and in re-swelled state (change in crystallinity and whitening or blushing) have been studied to propose a recipe for the preparation of efficient latex coatings. The combine study by SANS and SAXS show the FCC-like structure formation by the latex film, which become more organized with the inclusion of the that the hydrophilic shell.

1. I. Konko, S. Guriyanova, V. Boyko, L. Sun, D. Liu, B. Reck, Y. Men, Langmuir. 35 (2019) 6075.

Primary author: SAHA, Debasish (FZ Juelich)

Co-authors: Dr RECK, Bernd (BASF SE); FRIELINGHAUS, Henrich (JCNS)

Presenter: SAHA, Debasish (FZ Juelich)

Session Classification: Soft Matter

Track Classification: Soft Matter