VERIFICATION OF THE SUITABILITY OF LDH FOR STABILIZATION AND DEACIDIFICATION OF ACIDIC PAPER INFORMATION CARRIERS

Jurišová J., Malečková S., Guzikiewiczová E., Vizárová K., Danielik V., Králik M.

Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava, Radlinského 9, 812 37 Bratislava, Slovakia

Sizing agents used in papermaking raised up a variety of hydrophilic (inside) and hydrophobic (surface) features of the paper. Taking into account these facts and requirements for simplicity of deacidification technologies, polar (water) and non-polar (alkanes, perfluoralkanes, hexametyldisiloxane and similar) are used as supports for deacidification components (magnesium and calcium species, amines, etc.). In the project deacidifying agent as layered double hydroxides (LDHs) were tested. LDHs were applied in the form of colloidal dispersions in mixed (polar and non-polar) solvents. "Hydrophobic steps" are followed by "hydrophilic" ones, to achieve solvated species, swelling of cellulosic parts and penetration/diffusion of deacidification reactants to the reaction places.

During accelerated aging two types of acidic paper were tested: paper with lignin N-L content (oxidation effect can be monitored) and without lignin N-LF content (indirect monitoring of glycosidic bond - hydrolysis effect is possible through the solution properties of cellulose as a paper component).

Chemical (pH of surface, limiting viscosity number – decomposition of glycosidic cellulose bond), mechanical (folding endurance – life extension coefficient), spectral (FTIR – oxidation index) and optical properties (color change – colorimetry) were monitored.

This work was supported by the Slovak Research and Development Agency under the Contract no. APVV-18-0155 MUFUSCEM.