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The effects of biodegradable coating on properties of printing paperRouzbeh Asadi Khansari¹, Mohammadreza Dehghani Firouzabadi² and Hossein Resalati³¹Technical and Vocational University, Iran²Gorgan University of Agricultural Sciences and Natural Resources, Iran³Sari University of Agricultural Sciences and Natural Resources, Iran

Coating improves paper properties and can be applied in production and converting of paper. The main purpose of this research is to investigate the effect of biodegradable coatings on physical and mechanical properties of printing paper. The coatings were composed of kaolin clay, ground calcium carbonate, dispersant and different ratios of polyvinyl acetate, lactic acid and distilled water. Five formulations were made and the formulations had 30% or 50% solid content. After coating using bar method, the base papers were dried and calendered. Physical, barrier and mechanical properties were examined for each sample. The pigments and binders can be seen in the field emission scanning electron microscope (FESEM) view graphs. Fourier transform infrared spectroscopy (FTIR) analysis confirmed the presence of binders and their reactions. The results were obtained from ANOVA and Duncan tables. The coating treatments improved many of the mechanical properties (tear and burst) but had an adverse effect on the mechanical indexes. All measured optical properties (brightness, opacity and yellowness) were improved due to coating. Water absorption values (Cobb) were increased in the many treatments, but it was reduced in one formulation in order to more binders. The three combinations of coatings with 50% solid content reduced roughness which had correlation with improvement of barrier properties. The best barrier properties were found in the 3 combinations. The third suspension with 50% solid had the best droplet contact angle and contact angle change over time. The results showed that our slurry formulations decreased air permeability and water vapor transmission rate (WVTR) in the coated papers.

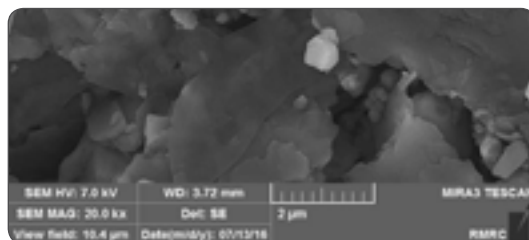


Figure : Clay particles on the coated paper.

Recent Publications

1. Rouzbeh Asadi Khansari, Mohammadreza Dehghani Firouzabadi and Hossein Resalati (2017) The effect of coatings and coating weight by two types of PCC on barrier and optical properties and roughness of paper. *Iranian Journal of Wood and Paper Industries* 8(2):283-295.
2. Asadi Khansari R, Dehghani Firouzabadi M R and Resalati H (2017) Fluting and kraft liner papers with GCC coatings and PVA binder. *Journal of Wood and Forest Science and Technology* 24(1):145-160.
3. Rouzbeh Asadi Khansari, Mohammadreza Dehghani Firouzabadi and Hossein Resalati (2016) The effect of biodegradable coatings on the barrier properties of papers. *Iranian Journal of Wood and Paper Industries* 7(1):91-101.

Biography

Rouzbeh Asadi Khansari is a Lecturer in the Faculty of Sowmeih Sara, Department of Wood and Paper Industry at the University of Technical and Vocational, where he has been a Faculty Member since 1997. He is the Head of Wood and Paper Industry Department. He has completed his PhD at Gorgan University and his Undergraduate studies at Tarbiat Modares University (TMU). His research interests lie in the area of coating of papers by biopolymers and nano fibers and biotechnology for pulp and paper, ranging from theory to design to implementation. He has collaborated actively with researchers in engineered wood and fibers composites, particularly wood modification on problems at the panel/fiber interface.

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