

Suberinic acids as paper coating for active packaging for cosmetic products

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INTRODUCTION

Depolymerized suberin was provided by Latvian State Institute of Wood Chemistry. Because of its antioxidant properties and natural origin it was used as coating on two types of paper: thick paper and backing paper in order to prepare natural active packaging material for water-based and oil based cosmetic products. It was applied on the surface of thick paper in concentrations of 30, 50, 70 % and dried in the oven, and on the surface of the backing paper without dilution. Thermal, mechanical, antioxidant and morphological properties of liquid and cured coating were examined.

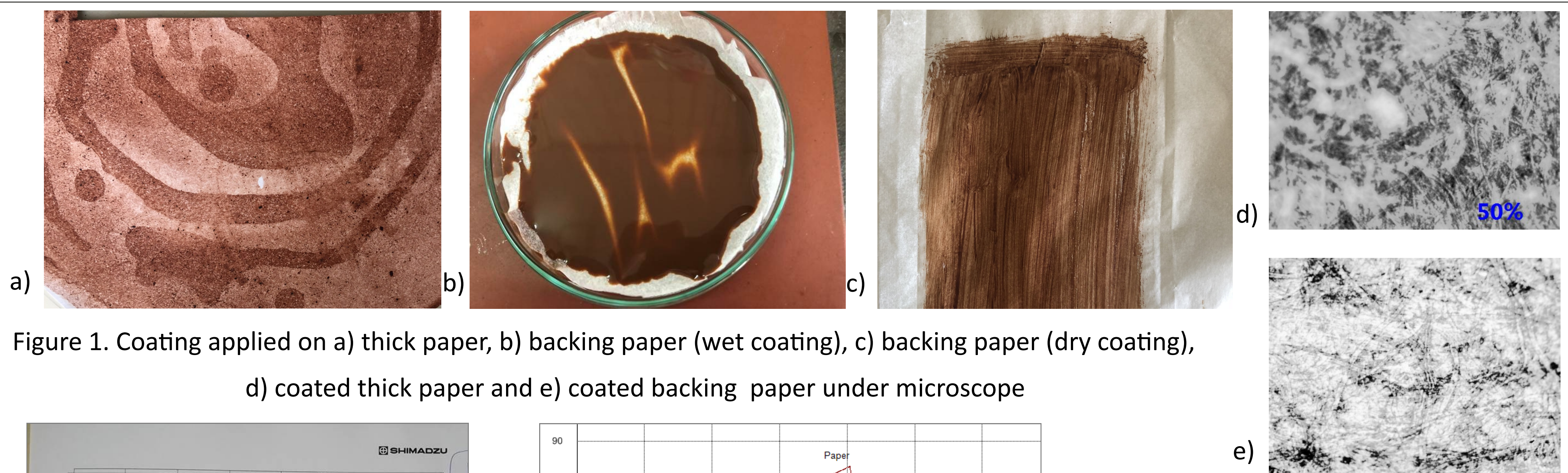


Figure 1. Coating applied on a) thick paper, b) backing paper (wet coating), c) backing paper (dry coating), d) coated thick paper and e) coated backing paper under microscope

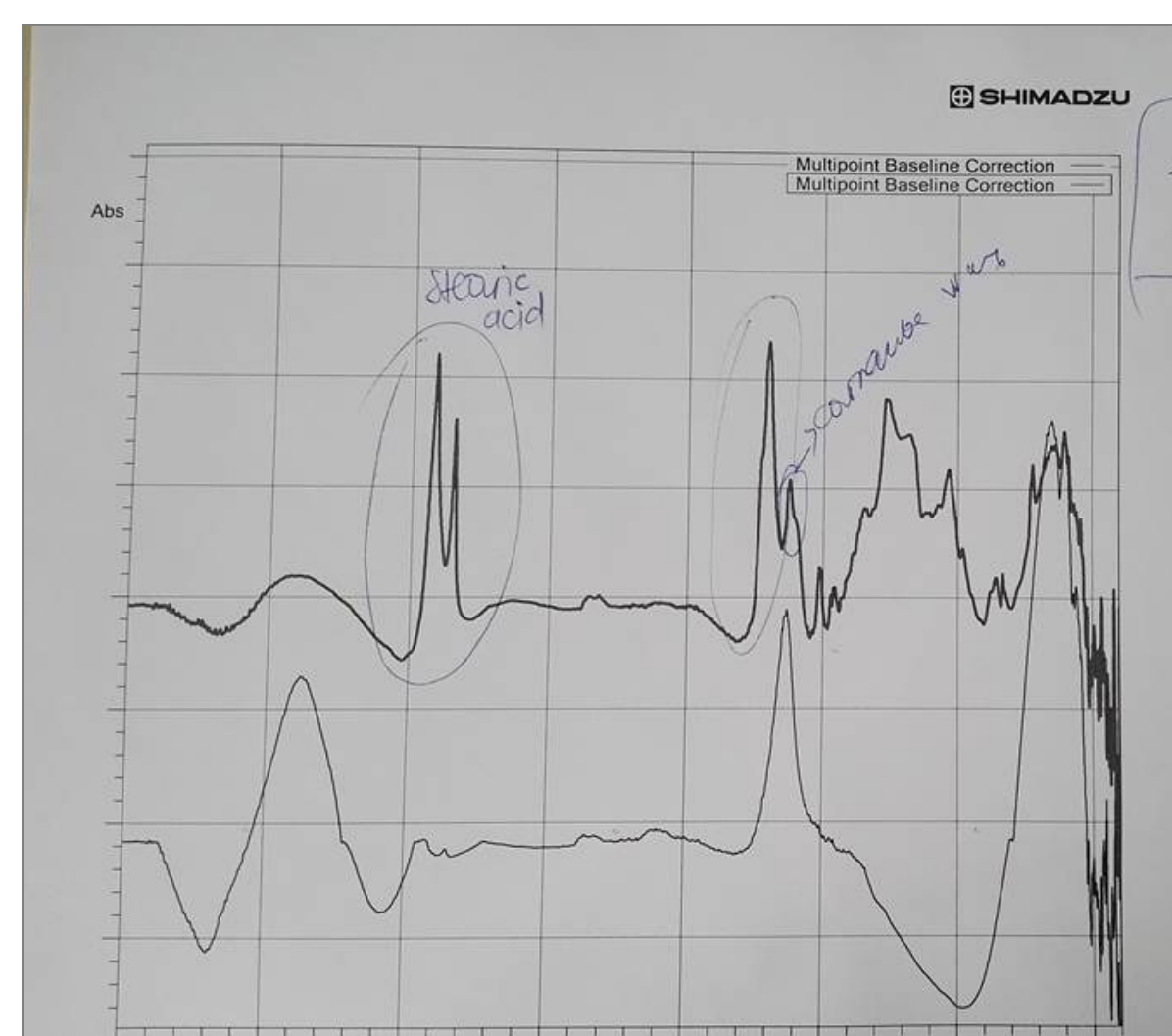


Figure 2. FT-IR shows presence of humic acid, stearic acid and carnauba wax. Detailed HPLC-MS analysis are planned in future

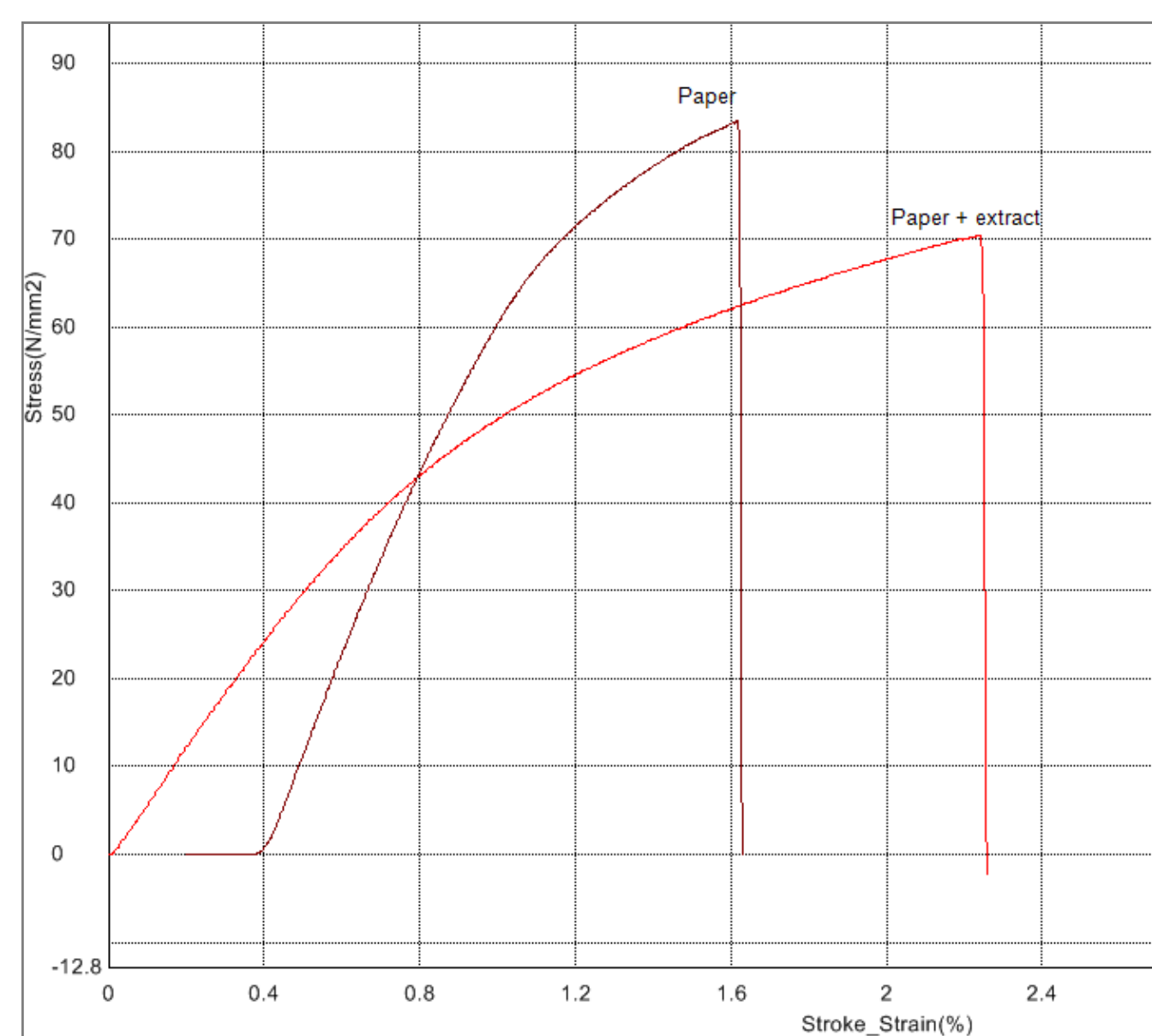


Figure 3. Mechanical properties of backing paper and coated backing paper

Antioxidant capacity :

° liquid sample : $44,2246 \pm 0,9745 \mu\text{M}$

Trolox/g

°° dry sample: $4,7545 \pm 0,0371 \mu\text{M}$

Trolox/g

Water vapor transmission rate :

° Baking paper: $49.6855 \text{ g/h} \cdot \text{m}^2$

°° Paper with coating: $42.2 \text{ g/h} \cdot \text{m}^2$

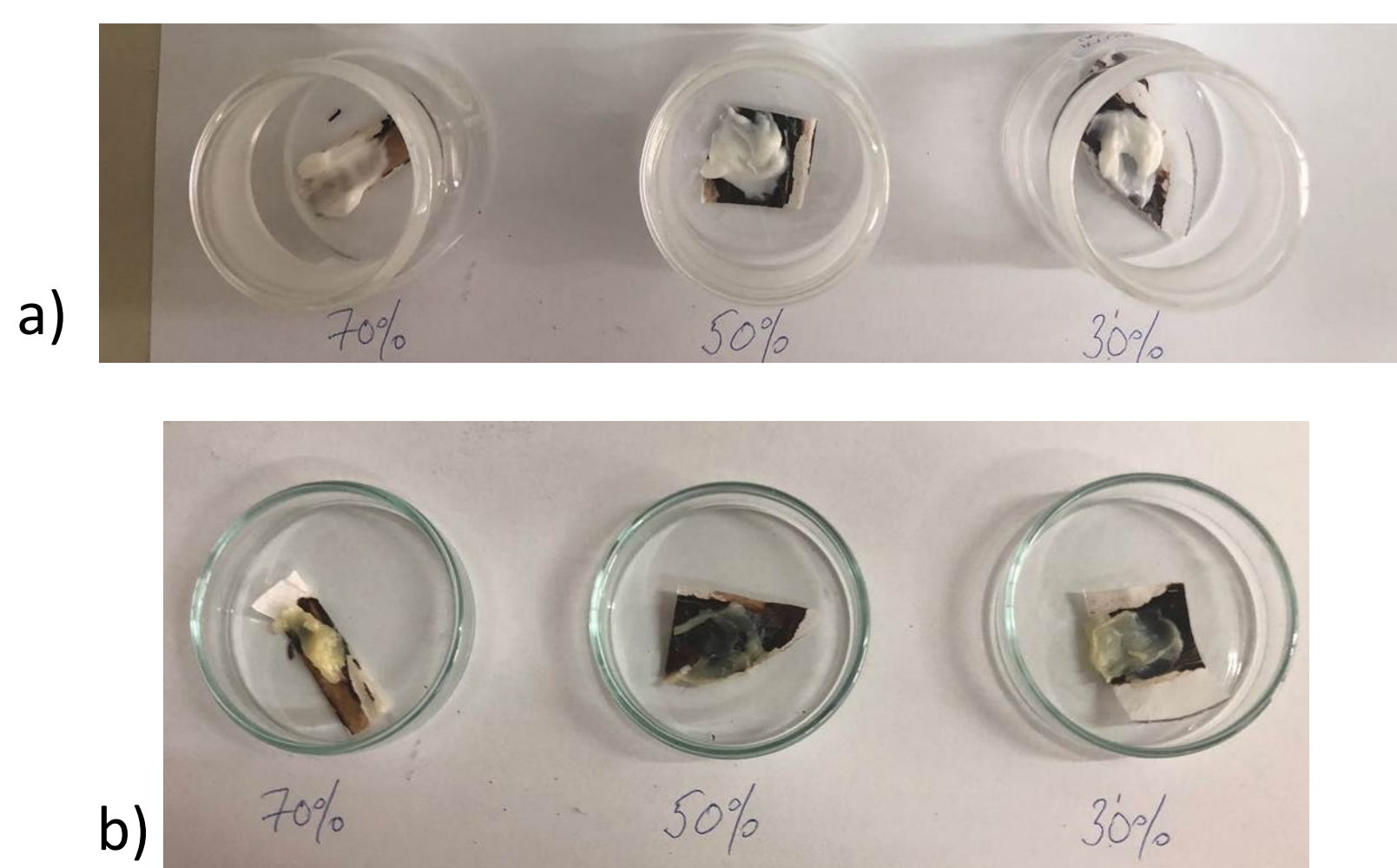


Figure 4. a) O/W emulsion and b) Oil-based product

CONCLUSION:

Thick paper is not good substrate because it is porous and no coating film is formed. Backing paper is better substrate, coating improved mechanical and barrier properties. It was observed that cosmetic products change color and loss water during longer contact with coated backing paper. Colorimetric measurements of products are foreseen. Problem with forming of monodose packaging sachets occurred and further work on overcoming this is planned.



Figure 5. Bio-based active packaging sachets

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