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HYDROGEL AND ENZYMES COMBINATION FOR PAPER DOCUMENTS CLEANING

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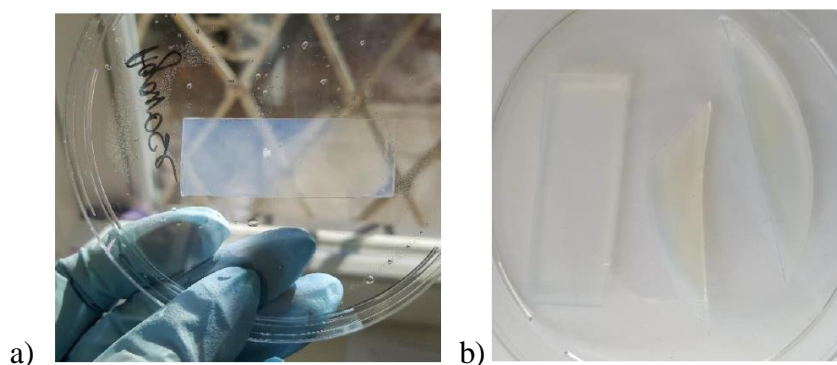
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Hydrophilic gels (hydrogels) are liquid-solid systems of a solid water-based matrixes that are able to swell but do not dissolve in water forming a three-dimensional network. The network consists of hydrophilic polymers that are swollen in water or inorganic additives that increase viscosity and retention. The properties of the hydrophilic material depend on the gelling agent, i.e. polymer functional groups (hydroxyl (-OH), carboxyl (-COOH), amide (-CONH-) and others) [1]. Also, these hydrogels could be used with other materials to improve their efficiency. Recently, hydrogels have been modified with various organic solvents, enzymes, neutralizing agents, biocides, etc. to improve and increase their capacity and selectivity for various cleaning procedures [2].

Given the importance of the preservation of paper medium, the objective of this study is to adapt the hydrogels and hydrolytic enzyme combination for paper cleaning process and to investigate their effect on paper properties. During this study the change of acid and optical properties of the paper samples, which were affected by hydrogels (TopVision Agarose, Gellan Gum Kelcogel CG-LA, PhytigelTM) and hydrolytic enzymes was examined. Paper samples were cleaned with hydrogels-enzyme composition, after samples were dried at room temperature. During research the following methods were used: SEM, FT-IR spectroscopy, colourimetry and acidity measurements.



1. Fig. Photo of TopVision Agarose gel a) before cleaning, b) after cleaning of paper sample.

References

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