

Salt-containing enzyme-imprinted polymer hydrogels for pH-triggered enzyme release in skin care applications

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In a previous study [1], we have shown that the pH-triggered release of enzymes from polymer hydrogels molecularly imprinted with enzymes (enzyme-MIP-hydrogels) is possible and usable in skin care applications. Although a higher enzyme release was found at pH 5 than at pH 7, enzyme release at pH 7 was still too high to obtain a shelf-stable product (i.e., a product with a neglectable enzyme release at pH 7). Within the scope of this work, the question of whether it is possible to decrease the enzyme release at pH 7 by adding salts to the hydrogel-matrix of the enzyme-MIP-hydrogels is examined in more detail. For this purpose, lipase-MIP-hydrogels containing different amounts of sodium chloride or calcium chloride were prepared and the lipase releases after 24 h at pH 5 and pH 7 were measured. It was found that by increasing the salt content of the lipase-MIP-hydrogel, the ratio of lipase release at pH 5 to lipase release at pH 7 increases. This effect is more pronounced with sodium chloride than with calcium chloride.

[1] O. Brüggemann, T. Volk, Controlled Release of Active Agents From Molecularly Imprinted Polymers in Skin Care Formulations, Poster presentation MIP 2016, Lund, Sweden, 26.-30.06.2016.