

Hydrogel films based on modified alginate as a base for personalized antibacterial wound treatment

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Materials based on natural polysaccharides are increasingly used for innovative wound dressings which have more extensive requirements that current medical products on the market cannot provide [1]. The issue of open wounds treatment became crucial in Ukraine due to the ongoing war, necessitating wound dressings that provide mechanical, antibacterial protection, and accelerate healing process.

In this work, ethonium-containing hydrogel films were developed using partially hydrophobized alginate (AlgM) unmodified alginate (Alg) and 1:1 mixture of Alg and AlgM (Alg+AlgM). These films were studied to determine the effect of alginate modification on ethonium release kinetics. The kinetics study was conducted at two pH values representing inflamed wounds pH 7.2 and chronic wounds pH 8.2 [2]. Figures 1 and 2 show that modification of alginate reduced degree of drug release.

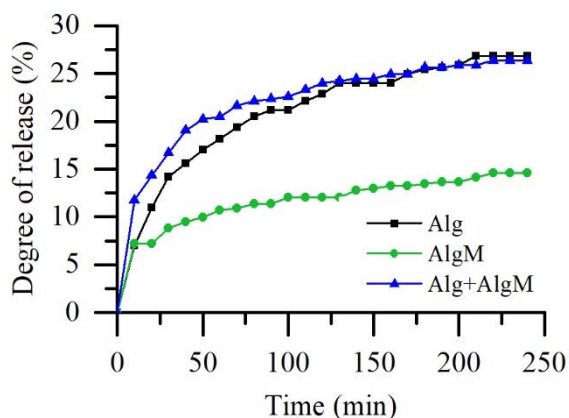


Fig. 1. Release kinetics of ethonium at pH 7.2

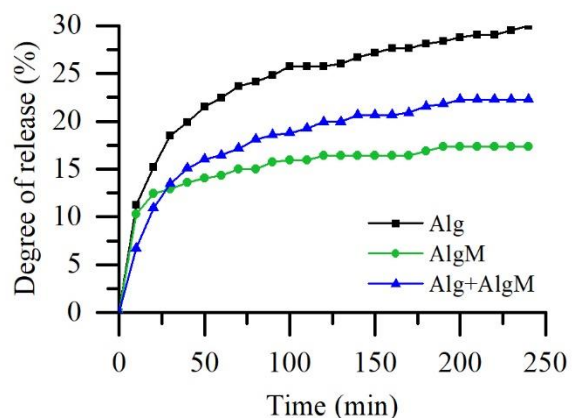


Fig. 2. Release kinetics of ethonium at pH 8.2

The results indicate the potential for further investigation of hydrogels based on mixture of polysaccharides. Such systems would enable specialized drug delivery to wounds of different causes, allowing for personalized treatment for individual patients.

1. E.R. Ghomi, S. Khalili, S.N. Khorasani, *et al.* J. Appl. Polym. Sci. **136**(27) (2019).
2. P. Kumar, T. Honnegowda. Plast. Aesthet. Res. **2** (2015) 257.