18th INTERNATIONAL SYMPOSIUM ON ELECTRETS

An application of corona treated and chemically modified poly(D-lactic acid) films as Benzydamine hydrochloride carriers

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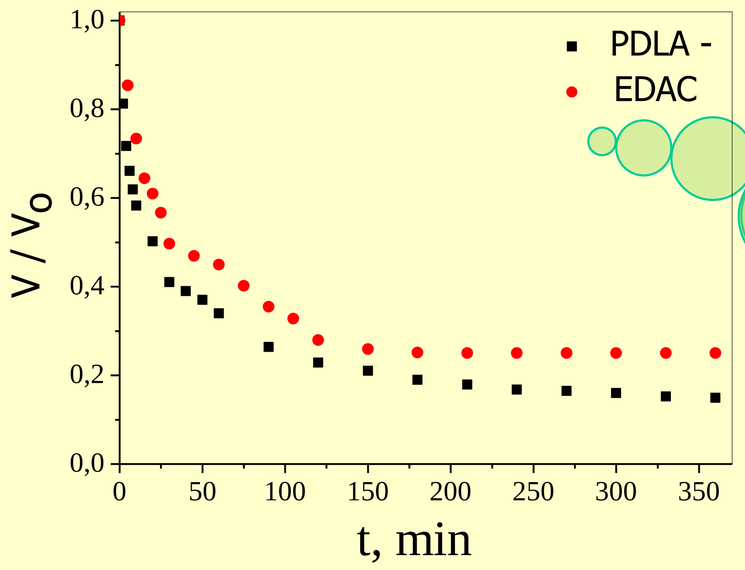
AIM: **to investigate the effect of corona treatment and chemical modification of poly(D-lactic acid) (PDLA) substrates on their potential to be used as Benzydamine hydrochloride (Benz) loaded multilayers.**

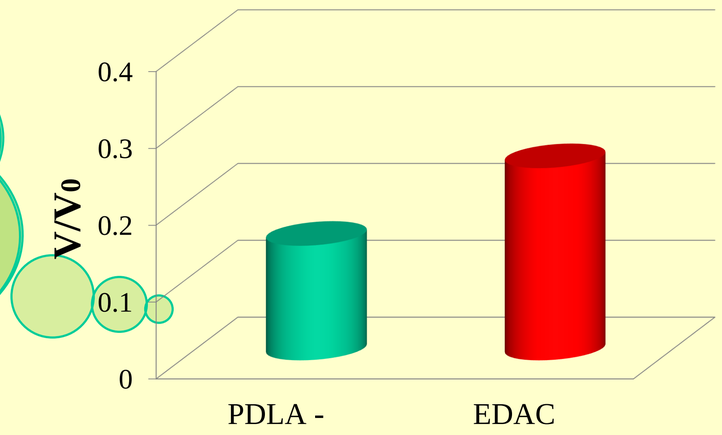
Poly(D-lactic acid) films were modified both:

physically	**chemically**
under negative corona discharge	with N-Ethyl-N′-(3-dimethylaminopropyl) carbodiimide hydrochloride (EDAC)

Time storage influence

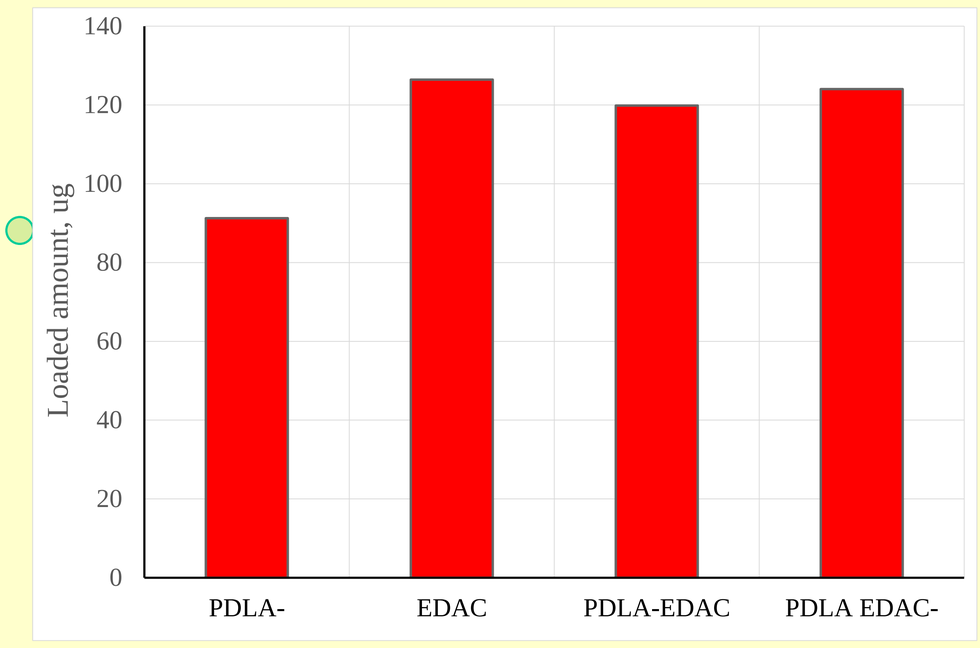


- For all investigated samples the values of the normalized surface potential are initially decaying exponentially for the first 30 minutes and then are slowly decreasing and are practically stabilized to the 360 minute.
- The steady state values of the normalized surface potential for the samples charged in a negative corona are lower than those for the samples modified with EDAC.

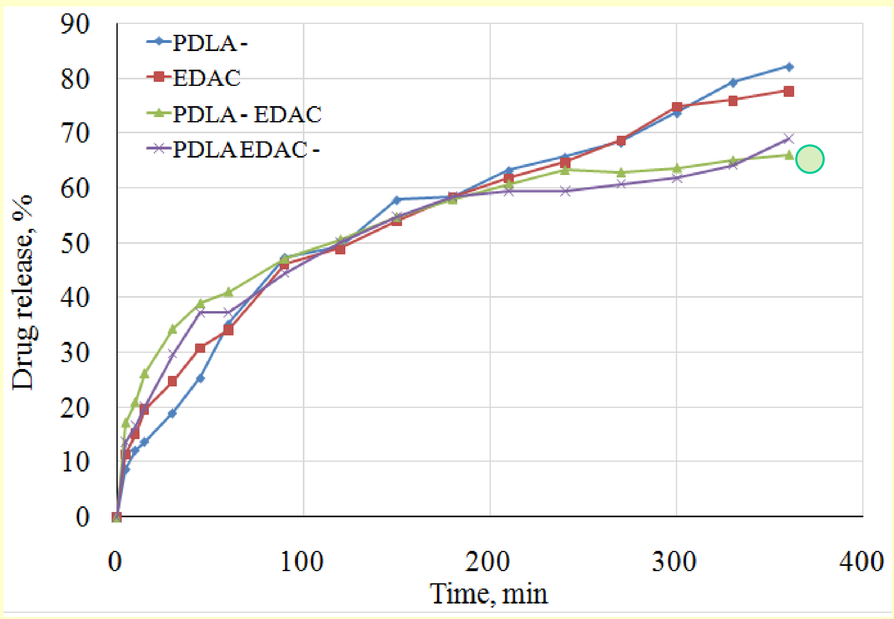


Drug loading efficiency

- The results demonstrate that the chemical modification of the PDLA substrates increases the amount of Benzydamine hydrochloride loaded in the multilayers;
- The combination of corona treatment and chemical modification results in lower amounts of loaded drugs in both cases, when compared with only chemically modified samples.



Drug release



- For the chemically modified samples the main principle, governing the multilayer buildup, shifts from electrostatic interactions to chemical bonding;
- Before the 210 min the rate of release is comparable for all modifications;
- A possible cause for the change in release rate can be the differences in the multilayer structure, caused by the difference in interactions between the substrate and the polyelectrolytes.

CONCLUSION

It was established that:

- **The steady state values of the normalized surface potential for the samples charged in a negative corona are lower than those for the samples modified chemically with EDAC.**
- **The chemical modification increases the amount of Benzydamine hydrocloride loaded in the multilayers obtained.**
- **For the chemically modified samples the main principle, governing the multilayer buildup, shifts from electrostatic interactions to chemical bonding.**

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