Effect of Nitric Oxide Gas on Hydrogels

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In this study, the effects of nitric oxide gas (NO) were investigated. Recent studies discovered that NO can be found everywhere in the body. It can act as an intercellular messenger, regulator and an immune system agent. Due to the similarity between hydrogels and cytoplasm, they were used to predict the influence of NO on the cytoplasm and also to study the effect of NO on some types of proteins.

Our theory predicts that NO can increase the translational diffusion of hydrogels, in other words it can accelerate the melting of the gels. 1.25% type A gelatin gel was prepared, and left at temperature between 7-9°C, and then NO gas was added to the gel and also left at the same temperature. Also 1.25% type A gelatin was prepared with D2O and the same procedures were applied.

The behaviour of the gels was studied at 30°C by means of dynamic light scattering (DLS). The translational diffusion of the samples prepared without NO was $1.727e^{-7} \pm 1.677e^{-10}$cm²/sec, and for samples prepared with NO was $2.701e^{-7} \pm 1.818e^{-10}$ cm²/sec. For the gels prepared with D2O the translational diffusion was 7.617 $e^{-8} \pm 8.427\ e^{-11}$cm²/sec for samples without NO, and $1.23e^{-7} \pm 1.386e^{-10}$ cm²/sec for samples with NO.

The results support our theory that the NO gas has an influence in increasing the translational diffusion of hydrogels and it accelerates the melting process of the gels.