## Nanochemistry and biotechnology

# Preparation and characterization polyvinyl chloride film doped with $CuO/SiO_2$ nanocomposite for the nitric oxide release

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Nitric oxide in often refers as vasodilatation agent in blood vessels which relax a smooth muscle cells of vessels walls which increase blood flow rate and decrease the blood pressure. Specials attention to the NO-release is called due to its potential role in combating of the cardiovascular diseases. Therefore investigations in molecules and reaction which can produce NO in blood vessel are in high demand [1].

In this work a polyvinyl chloride/copper oxide polymer films (PVC/CuO films) were prepared for the generation NO oxide. Films were fabricated by casting of homogeneous suspension of CuO in PVC (in N,N-dimethylformamide) on a hotplate, an unfilled PVC films were prepared by the same route and used as control in catalytic reaction of NO-release.

The results of scanning electron microscopy (SEM), atomic-force microscopy (AFM) showed that the composites are a hybrid of the polymer and the copper oxide particles, and these particles were distributed uniformly in the polymer matrix. The Griess reaction was used to determine NO production. It is thus anticipated that catalytic generation of NO from endogenous nitrosothiols will render such polymeric materials more thromboresistant when in contact with blood.

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1. *Joyner M.,* Dietz N. Nitric oxide and vasodilation in human limbs // J. Appl. Physiol. – 1997.-83(6).-P. 1785-96