DIAMOND LIKE CARBON COATING IN VENTRICULAR ASSIST DEVICE

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Ventricular Assist Device (VAD) is developing in IDPC to restore hemodynamic conditions of

patients with severe heart failure, until they recover [1]. A centrifugal VAD operates in

continuous flow through a rotor kept suspended for pivotal bearing system; when implantable

must be biocompatible, low density, corrosion resistant and abrasion. Diamond Like Carbon

(DLC) coating by Chemical Vapour Deposition has been applied in metallic and polymeric

components of DAVs to improve biofunctionality [2]. With collaboration of INPE, the Plasma

Enhanced Chemical Vapor Deposition technique was applied to polycarbonate rotor coat. From

hydrogen and methane at low pressure, the deposition was 60 minutes at 80 ° C. A metal cage

was used to imprison ionized gas around rotor to allow coating of areas of difficult access with

less time and exposure temperature. The properties of in polycarbonate DLC were studied by

Raman Spectroscopy; the amorphous carbon is observed in two broad band's called G (1560

cm -1) and D (1350 cm -1). The rheological influence of viscous friction of polycarbonate pure and

coated in DLC can be compared in vitro assay for analysis of electrical current consumption.

The rotor was immersed in 4 liters of water with fixed voltage in 20 volts; the current can be

registered by a digital multimeter in different rotations (250, 500, 750, 1000, 1250, 1500, 1750

and 2000 rpm) with the aid of a DRV8x Evaluation Kit - Texas Instruments.

References

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a 01 de novembro de 2015.

Acknowledgments

We would to thanks brazilian agencies: INPE, FAJ, FAPESP e CAPES.