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Plasma assisted deposition of graphen-like coatings for orthopedic applicationsVictor N. Vasilets¹, Yury M. Shulga², Sergey A. Baskakov²¹IEPCP RAS, Chernogolovka, Russian Federation ²IPCP RAS, Chernogolovka, Russian Federation

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Previously, numerous pure carbon materials including diamond-like carbon, fullerenes and carbon nanotubes have been used for synthesis of biocompatible composites or implant surface coatings. The discovery of graphene, a single atom thick layer of sp² carbon, has expanded the research and development of new multifunctional biomaterials. An ideal candidate for implant surface coatings, graphene is atomically smooth, chemically inert, highly durable and low friction material. Furthermore, graphene has already been used in many biomedical applications including the growth of neuronal cells, human osteoblasts and other cells. In this investigation plasma chemical treatment in atmospheric DBD discharge was used to deposit graphene based films in order to improve wear resistance, friction characteristics and biocompatibility of Ultra-High Molecular Weight Polyethylene widely used for orthopedic applications. Chemical composition and structure of the surface layer before and after modification were characterized by XPS and FTIR ATR spectroscopy.

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Keywords

DBD discharge

graphene

XPS

FTIR ATR