

Diamond-like Carbon Coated Nano-structured Surface

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Owing to its superior tribological and mechanical properties with corrosion resistance, biocompatibility and haemocompatibility, diamond like carbon (DLC) has emerged as a promising material for various applications. DLC coating on rigid substrate has been the most common in various applications. However, recent results of DLC coating on soft polymer substrate resulted in nanostructured wrinkled surface. The nanostructured wrinkles were observed due to the strain energy minimization of the system by deforming the soft substrate. These coatings occurred in a thin film growth regime to where no previous investigations had been associated. Furthermore, the nanostructured surface resulted in novel surface properties that can cope with the difficult industrial requirements. Two possible applications to the surface modification of various fabrics and desalination filter will be presented. Long lasting hydrophilic surface, that would overcome the limit of the conventional hydrophilic surface, was also successfully prepared. For the extended controllability of the surface structure, we also developed two-step process: manipulation of the surface by ion beam or plasma followed by a functional coating. Various nanostructured surfaces mimicking nature like water strider, lotus leaf, snake skin, acacia leaf were successfully prepared. Evolution and mechanism of the nano-structure surface and their properties will be discussed.

