Effects of DLC-coatings on the Stability of Ceramic Glass via Plasma Enhanced Chemical Vapor Deposition

Jae-Un Kim[1,2], **Han-Cheol Choe[1*]**

Advanced Functional Surface and Biomaterials Research Lab, Department of Dental Materials and Convergence Research Center for Treatment of Oral Soft Tissue Dis 2Plasma Coating R & D Center, JNLTECH CO., Ltd., Gwangju, Republic of Korea ease (MRC), College of Dentistry, Chosun University, Korea

hcchoe@chosun.ac.kr

Abstract Recently, ceramic glass has been used in electric range plates, and its demand is increasing worldwide. The plate surface must be durable and corrosion-resistant and wear-resistant when preparing food. By applying DLC (Diamond-Like Carbon) coating technology that optimizes coating conditions through jig production and design for mass production, product physical properties and durability testing, and safety evaluation, durability and stability are better than the ceramic tops of commercial products. In this study, the following research was conducted to improve this. First, DLC coating was performed using plasma enhanced chemical vapor deposition on a ceramic glass plate for an electric range. To observe the wettability and hardness of the surface of a nano-sized DLC coated ceramic plate, the contact angle and nanoindentaion hardness of the surface were measured unsing instruments. of Structure analysis of surface was evaluated through X-ray diffraction analysis. To test the corrosion resistance of the coated surface in NaCl electrolyte to suit the actual environment, the measuring device used a frequency response detector (model 1025. EG & G, USA) and the scan rate was 1.67 mV/min from -1000 mV to 2000 mV. After performing the electropotential anodic polarization test, the surface of the specimen is observed with FE-SEM. AC impedance test was performed in NaCl solution for polarization resistance of DLC-coated surface. (This work was supported by the Technology development Program (00223520) funded by the Ministryof SMEs and Startups (MSS, Korea)) hcchoe@chosun.ac.kr).

Keywords: Electric range, Diamond-Like Carbon, Plasma enhanced chemical vapor deposition, Ceramic glass, Wettability, Corrosion behavior

Reference

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