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Enhanced Cell Adhesion on PMMA by Radio Frequency Oxygen Plasma Treatment

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Abstract : In this study, PMMA films are modified by oxygen plasma treatment for biomedical applications. The plasma generator is capacitively coupled radio frequency (13.56 MHz) power source. The oxygen pressure and gas flow rate are kept constant at 40 mTorr and 30 sccm, respectively and samples are treated for 2 minutes. Hydrophilicity and biocompatibility of PMMA films are studied before and after treatments in different applied powers (10-80 W). In order to monitor the plasma process, the optical emission spectroscopy is used. The wettability and cellular response of samples are investigated by water contact angle (WCA) analysis and MTT assay, respectively. Also, surface free energy (SFE) variations are studied based on the contact angle measurements of three liquids. It is found that RF oxygen plasma treatment enhances the biocompatibility and also hydrophilicity of PMMA films.

Keywords : cellular response, hydrophilicity, MTT assay, PMMA, RF plasma
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