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Sterilization Performance and Material Compatibility of Sterilizer for Dental Instruments using RF Oxygen Plasma YASUHIRO SAKAI, ZHEN LIU, NOBUYA HAYASHI, Kyushu University, MASAAKI GOTO, Saga University — The sterilization performance and material compatibility of low-pressure RF plasma sterilization method for dental instruments were investigated. RF electrode used in this experiment has been optimized for sterilization of dental instruments. The vial-type biological indicator (BI) simulating tiny space of dental instrument was used for evaluation of the sterilization performance. The pressure in the stainless chamber was fixed at 60 Pa. Sterilization of BI was achieved in shortest time 40 min at 80 W, and the sterilization effect was confirmed using three BIs. Light emission spectra of oxygen plasma indicated that production of atomic oxygen and excited oxygen molecule are maximum at pressure of 20 Pa and 200 Pa, respectively. Sterilization results of BIs indicated that successful rate increases with the oxygen pressure towards 200 Pa. Therefore, the excited oxygen molecule is deduced to be a major factor of the sterilization of BI. Surface morphology of dental instruments such as diamond bar was evaluated using scanning electron microscope (SEM). The deterioration of fine crystals of diamond bar has not observed after the plasma irradiation for 120 min with RF input power was 60W and pressure was 200 Pa.

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