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**BIOACTIVITY AND CORROSION RESISTANCE OF
NiTi AFTER CALCIUM PLASMA IMMERSION ION
IMPLANTATION**

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Plasma immersion ion implantation (PIII) is an effective approach to enhance the surface properties of various types of biomaterials. In order to enhance the surface bioactivity and corrosion resistance of NiTi shape memory alloy, calcium ions were implanted into NiTi alloys that have been pre-plasma-implanted with oxygen and nitrogen. The results are compared to samples without pre-treatment. The bioactivity of calcium-implanted NiTi was evaluated by immersion tests in simulated body fluid (SBF). The surface of NiTi before and after immersion tests was characterized by X-ray photoelectron spectroscopy (XPS). The XPS results reveal that the structure of the calcium-implanted layer in all the samples is composed of calcium oxide and gradually becomes a Ca-P layer after a period incubation in SBF. This Ca-P film also can be detected by scanning electron microscopy (SEM). To evaluate the anti-corrosion performance of NiTi, electrochemical potentiodynamic polarization tests were conducted on the NiTi samples in SBF. NiTi samples with pre-oxygen and nitrogen plasma implantation exhibit better corrosion resistance than single calcium-implanted samples. Our results indicate that calcium implantation can enhance the bioactivity of NiTi alloy due to the formation of calcium phosphate on the surface of the alloy. Plasma ion implantation can also improve the corrosion resistance of NiTi.