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**HYDROXYAPATITE PRODUCTION ON CP-Ti BY ECAE AND MAO PROCESSES**Akgun Alsarani<sup>1</sup>, Gencaga Purcek<sup>2</sup>, Yenal Vangolu<sup>1</sup>, Ozgu Bayrak<sup>1</sup>, Ibrahim Karaman<sup>3</sup>,  
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Pure titanium is currently used across a range of application sectors. CP-Ti is especially used as a biomaterial for ages. However, the low strength and the poor wear resistance and average bone bonding ability partially limits its usage in biomedical applications. Multi pass equal channel angular extrusion (ECAE), micro arc oxidation (MAO) and Hydroxyapatite (HA) coating are used to improve the strength, wear resistance and the bone bonding ability, respectively. In this study, CP-Ti (grade-2) was processed by ECAE using route-Bc. After ECAE process, samples subjected to micro arc oxidation (MAO) process in a solution containing Ca and P ions. The Ca, P and titania coated specimens hydrothermally treated inside a NaOH solution which had a pH value of 11.0-11.5 at various temperatures and time intervals in an autoclave. Microstructure and phase components of the coatings were characterized by using scanning electron microscope (SEM) and X-ray diffractometer (XRD) before and after hydrothermal treatment. It was observed that CP-Ti processed by ECAE and MAO showed an increase in strength and wear resistance. After hydrothermal treatment, HA crystals were formed on the surface. Consequently HA particles formed on the surface of the high strength CP-Ti with improved wear resistance.

**Keywords**

ECAE

MAO

Hydrothermal treatment

Hydroxyapatite

CP-Ti