

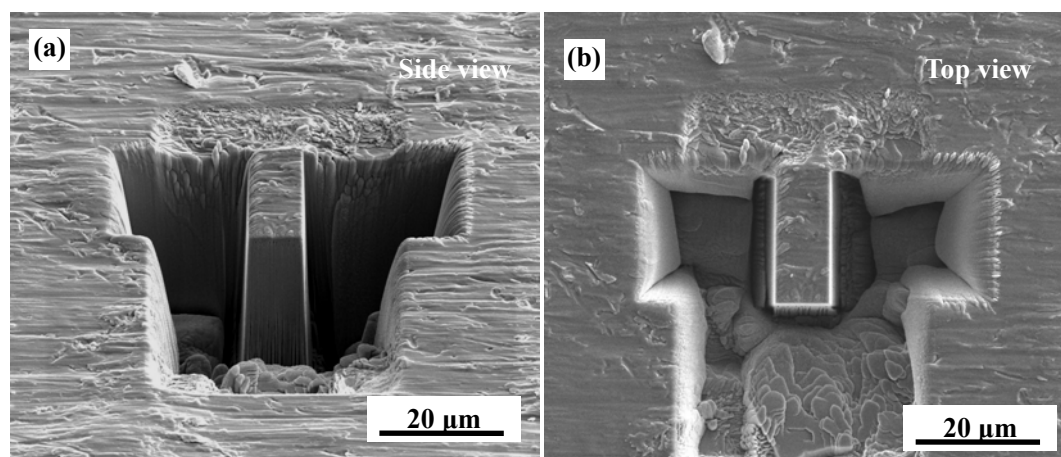


Fig.S1. Wall like convex formed on Ti plate by focus ion beam cutting: (a) the side view, and (b) the top view.

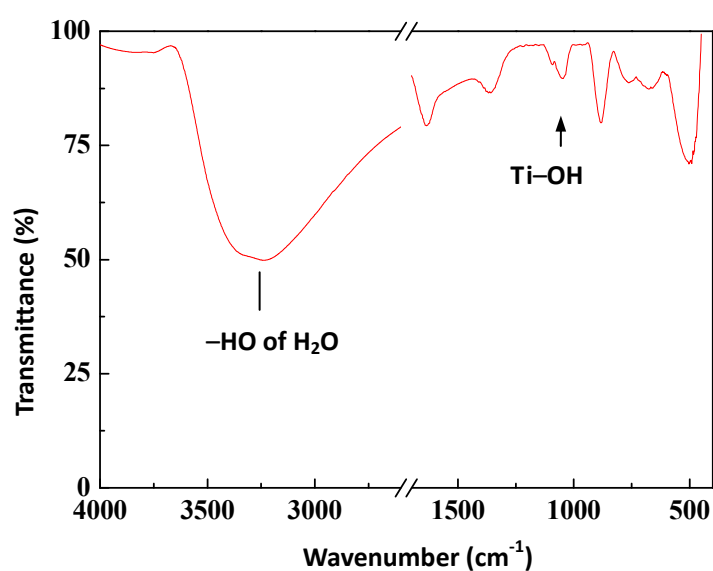


Fig.S2. FT-IR spectrum of the HT-A1-24 surface.

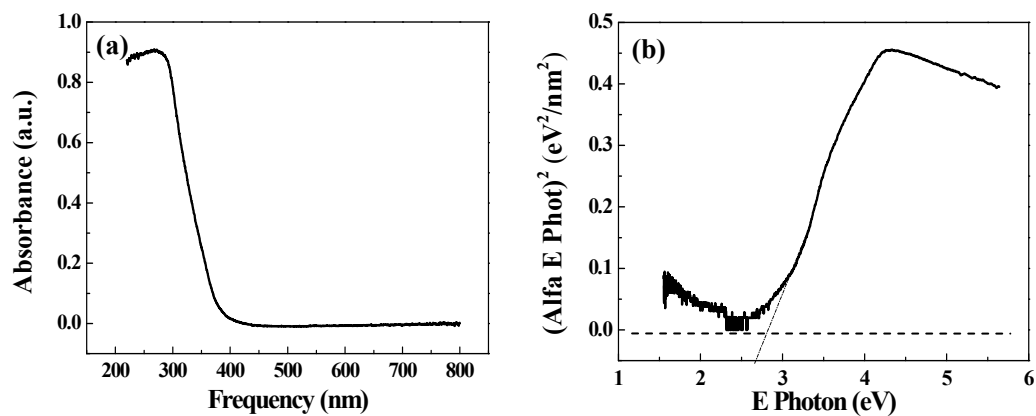


Fig.S3. (a) UV-vis spectrum of $\text{H}_2\text{Ti}_5\text{O}_{11} \cdot \text{H}_2\text{O}$ powder collected from the HT-A1 surface, (b) the $(\alpha h\nu)^2$ vs. $h\nu$ plot.

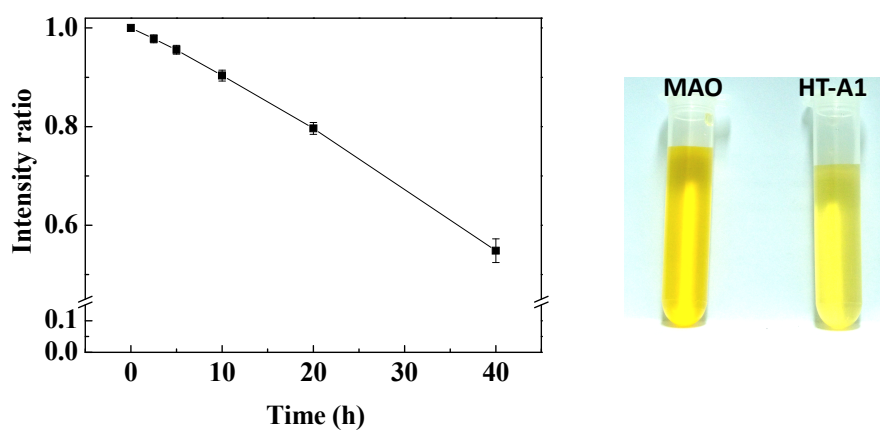


Fig.S4. The intensity ratio change of methyl orange UV-vis characteristic peak located at 465 nm between the HT-A1-24 group and the MAO group after UV irradiation for different time.

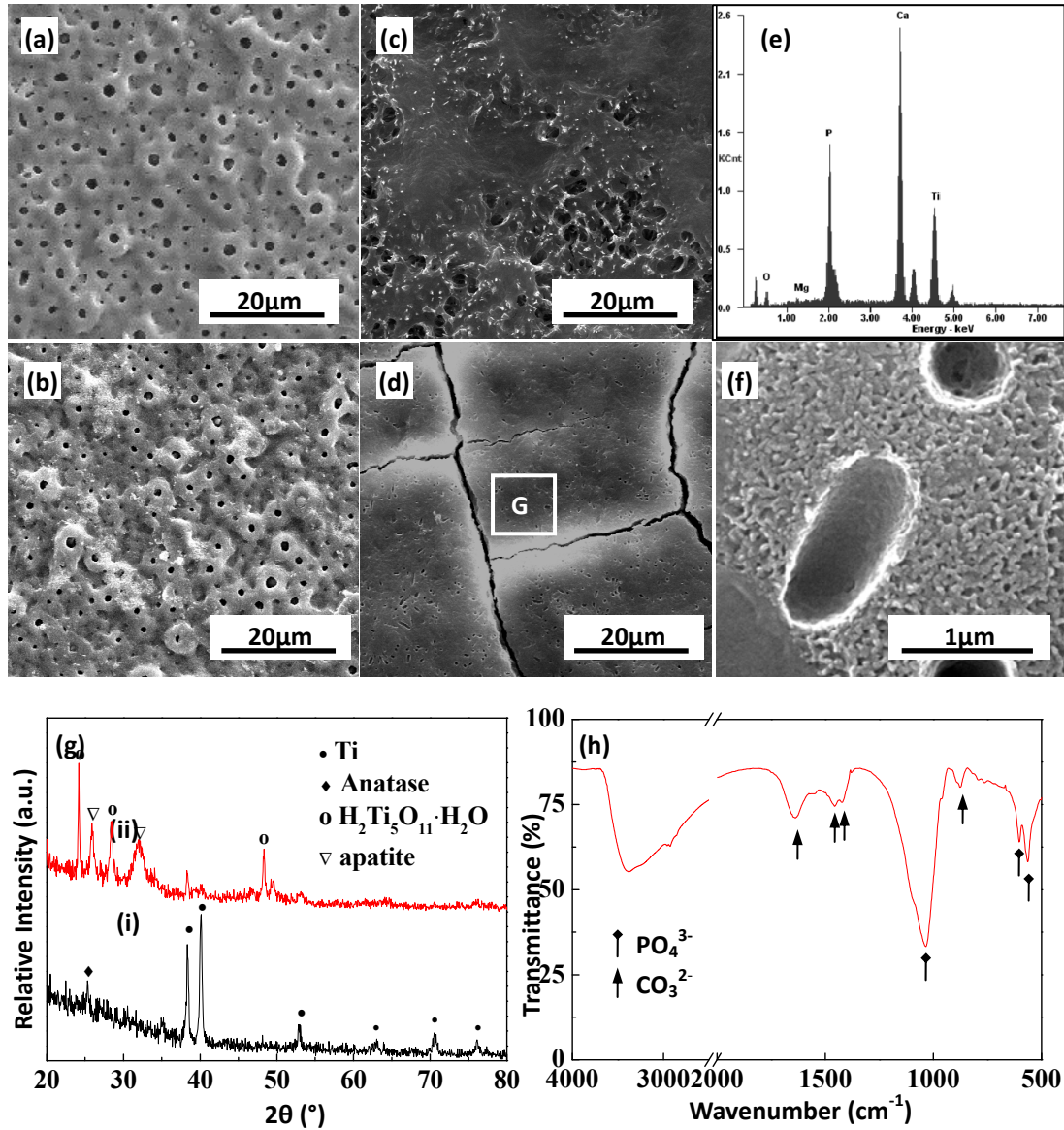


Fig.S5. The apatite-inducing ability of the MAO coating covered Ti plate and the HT-A1-24: SEM surface morphology of MAO coating covered Ti plate after SBF immersion for (a) 3 days and (b) 7 days, SEM surface morphology of the HT-A1-24 after SBF immersion for (c) 3 days and (d) 7 days, (e) the EDS spectrum detected from area E in Fig.S5(d), (f) the magnified surface morphology of area G in Fig.S5(d), (g) XRD patterns of the samples after SBF immersion for 7 days: (i) the MAO coating covered Ti plate and (ii) the HT-A1-24, and (h) FT-IR spectrum of the HT-A1-24 surface after SBF immersion for 7 days.

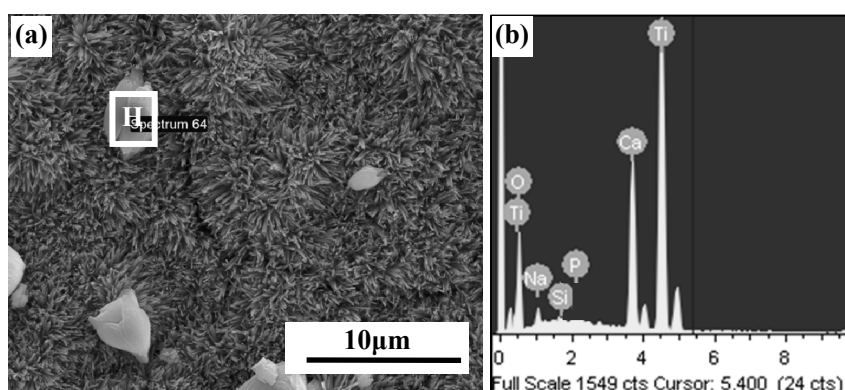


Fig.S6. Surface morphology and EDS spectrum of the MAO coating covered Ti plate after chemical treatment for 12h: (a) surface morphology, (b) EDS spectrum detected from area H in Figure S6(a).

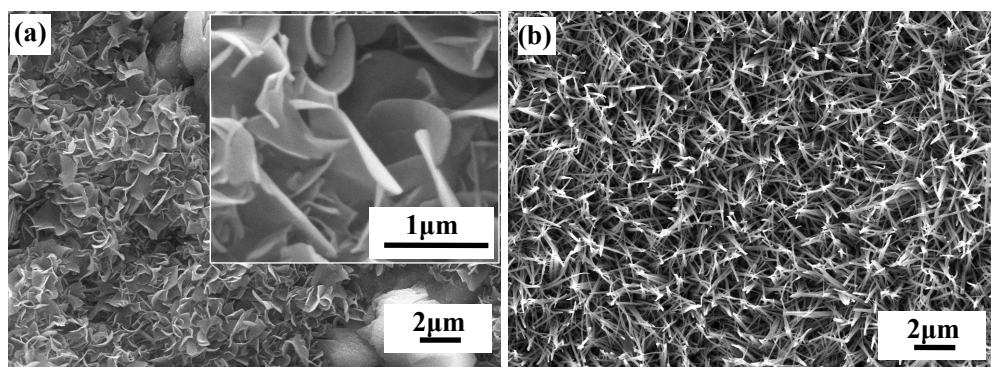


Fig.S7. Surface morphology of the MAO coatings containing different elements after chemical treatment in 1 mol/L NaOH solution for 24h: (a) Ca, P and Na, (b) Ca, Si and Na.