Supporting information for the article:

Lukić, M.J., Kuzmanović, M., Sezen, M., Bakan, F., Egelja, A., Veselinović, L., 2018. Inert atmosphere processing of hydroxyapatite in the presence of lithium iron phosphate. Journal of the European Ceramic Society 38, 2120–2133. https://doi.org/10.1016/j.jeurceramsoc.2017.12.023

Supporting info

Specific surface area (SSA) and carbonate content determinations

SSA determination of HAp powder was performed by standard BET method, measuring isothermal adsorption-desorption characteristics of N_2 adsorbate**,** at -198.5 °C. Prior to measurement, degassing of sample was performed. Measurements were done on Micromeritics Gemini 2370 V5 device (Norcross, GA, USA). SSA determination of LFP powder was done by the same method, using a Micromeritics ASAP 2020 instrument. Sample was degassed at 110 °C for 10 h under reduced pressure. The specific surface area of samples was from the linear part of the nitrogen adsorption isotherms.

Determination of content of total carbon was performed on LECO elemental analyzer model 628. Instrument range for carbon content is from 0.02 up to 175 mg, and precision range is 0.01 mg. Helium (99,995 %) was used as a carrier gas, whilst the sample was combusted in stream of pure oxygen (99,995 %). Prior to each measurement, calibration check was verified with certified reference material of EDTA.

Crystallographic parameters, particle size analysis, and phase composition after sintering

Table SI. Properties of prepared materials.

Sample	d (*hkl*) / nm	*a* / Å	*b* / Å	*c* / Å	*V* / Å^3	d_{50} – vol.* / μm	d_{50} – num.* / μm
HAp	8.1(*002*)	9.42665(5)	9.42665(5)	6.8816(3)	529.54(9)	5.8	0.41
LFP	37 (*311*)	10.3237(3)	5.9975(3)	4.690(5)	296.76(4)	10.2	0.24

*vol. – PSD by volume; num. – PSD by number; d_{50} – average particle size;

Table SII. Phase composition of non-isothermally sintered HAp –LFP composites.

Sample	Final phase composition$_{XRD}$ / %			
	HAp	**β-TCP**	**α-TCP**	**Fe- inclusions**
HAp	92.5	-	7.5	-
HAp + 1 % LFP	87	13	-	-
HAp + 2 % LFP	84	16	-	-
HAp + 5 % LFP	74	26	-	-
HAp + 10 % LFP	24	76	-	+

Sintering of HAp in air atmosphere

XRD patterns of HAp powder after high-temperature treatments in air atmosphere are shown. Heating of HAp powder up to 900 °C, which is the temperature where phase transformation and β-TCP formation would already happen in the case of non-stoichiometric, Ca-deficient HAp, did not result in the observable amount of another phase besides HAp. Moreover, application of high-temperature two-step sintering cycle, with the first temperature even at 1250 °C, also showed the exceptional thermal stability of synthesized HAp powder in an air atmosphere. Having in mind these findings, it is clear that the appearance of α-TCP phase after non-isothermal heating of HAp up to 1200 °C in Ar atmosphere was provoked by the shifted chemical equilibrium of dehydroxylation reaction in the absence of water in the sintering atmosphere.

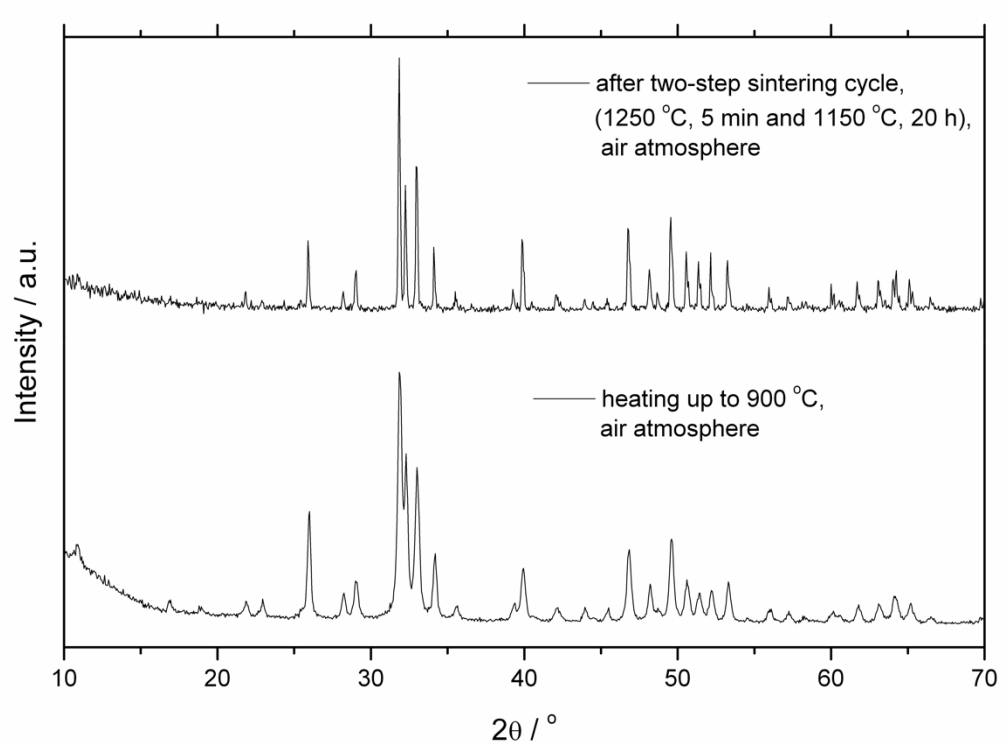

Fig. S1 XRD patterns of HAp powder after different high-temperature treatments.