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Hydroxyapatite of plate-like morphology obtained by low temperature hydrothermal synthesis

Victoria K. Besprozvannykh, Ilya E. Nifant'ev, Alexander N. Tavtorkin, Ivan S. Levin, Andrey V. Shlyakhtin and Pavel V. Ivchenko

S1. Synthesis of HAp

125 mL of 0.5 M $CaCl_2$ was added to 250 mL of water. The pH of the mixed solution was adjusted to 9.5. After 30 minutes of stirring, 125 mL of 0.3 M $Na_2HPO_4 \cdot 2H_2O$ was added to the reaction mixture, the pH was controlled at 9-10 during the reaction process. The mixed solution was kept at 75 °C for 48 h. The precipitate was filtered off, washed by H_2O, ethanol, and dried.

2.5 mL of 0.5 M $CaCl_2$ was added to 5 mL of water. The pH of the mixed solution was adjusted to 9.5. After 30 minutes of stirring, 2.5 mL of 0.3 M $Na_2HPO_4 \cdot 2H_2O$ was added to the reaction mixture, the pH was controlled at 9-10. The mixture was placed into glass ampule, the ampule was sealed and heated 8 h at 180 °C. After cooling, the precipitate was filtered off, washed by H_2O, ethanol, and dried.

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S2. X-ray diffraction data

X-ray diffraction patterns were obtained with Rotaflex RU-200 X-ray source (Rigaku, Japan) with rotating anode tube (CuKα radiation, 50 kV and 160 mA mode) equipped with a horizontal wide-angle goniometer Rigaku D/Max-RC with Bragg-Brentano θ-2θ geometry at angle range 2θ = 10-60°, step 0.02°, continuous scan rate 1°/min.

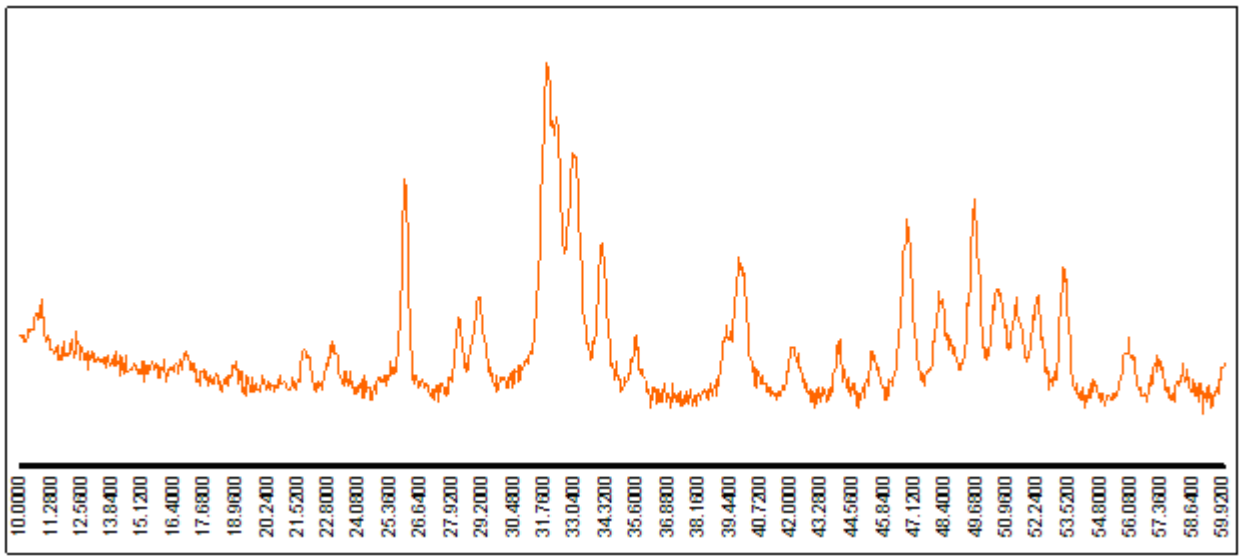

Figure S1 XRD pattern of HAp obtained at 75 °C

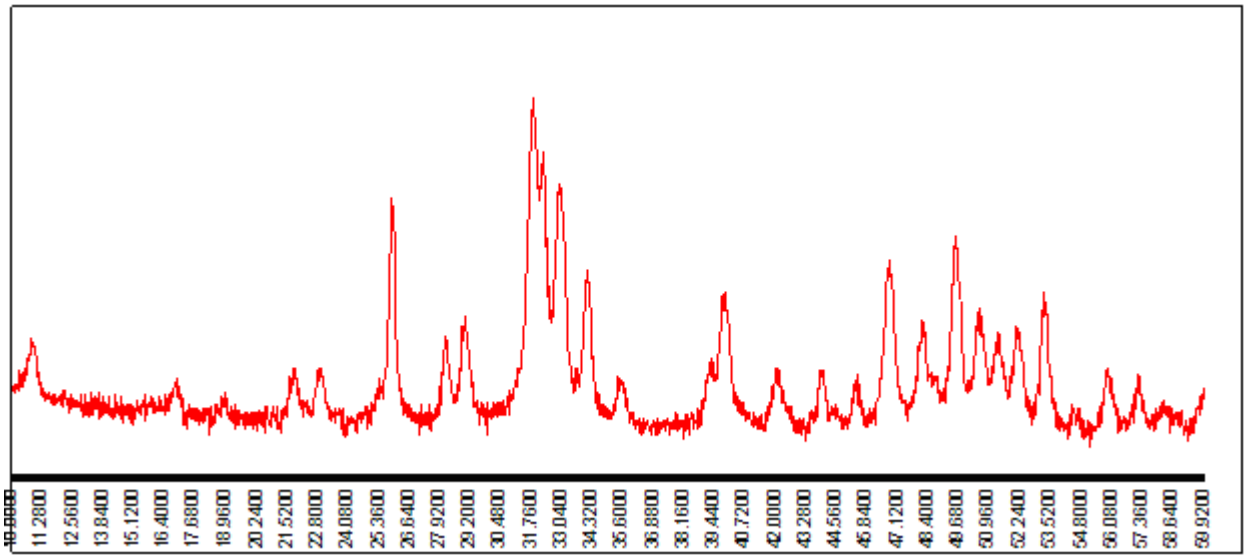

Figure S2 XRD pattern of HAp obtained at 180 °C

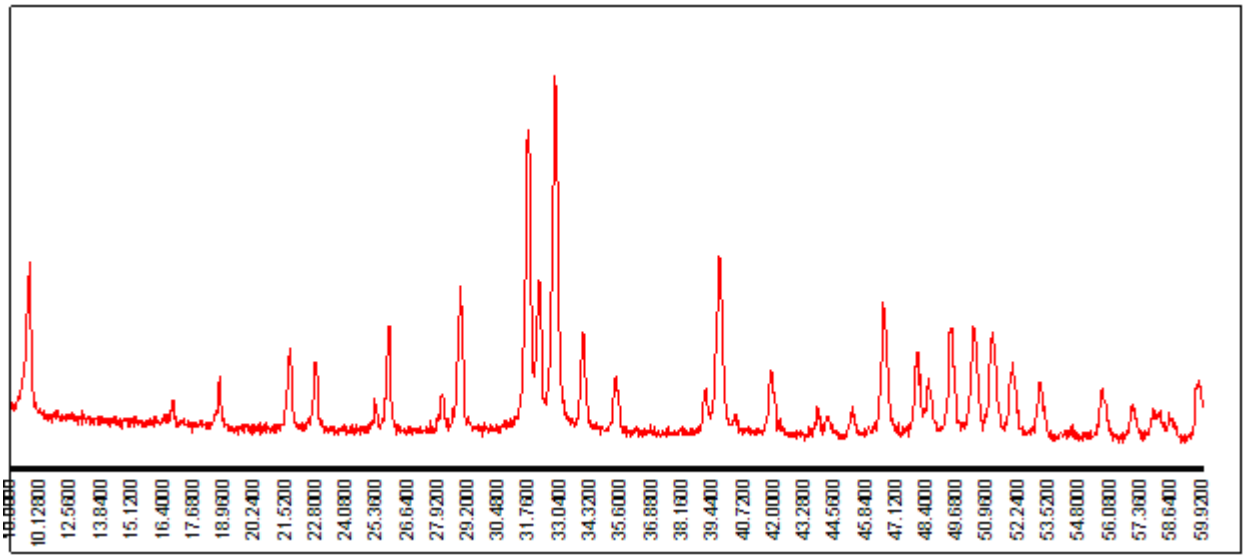

Figure S3 XRD pattern of HAp obtained at 120 °C (pH = 6)

S3. TEM data

Target-oriented approach was utilized for the optimization of the analytic measurements.[1] Before measurements the samples were mounted on a 3 mm copper grid and fixed in a grid holder. Samples morphology was studied using Hitachi transmission electron microscope (TEM). Images were acquired in bright-field TEM mode at 100 kV accelerating voltage.

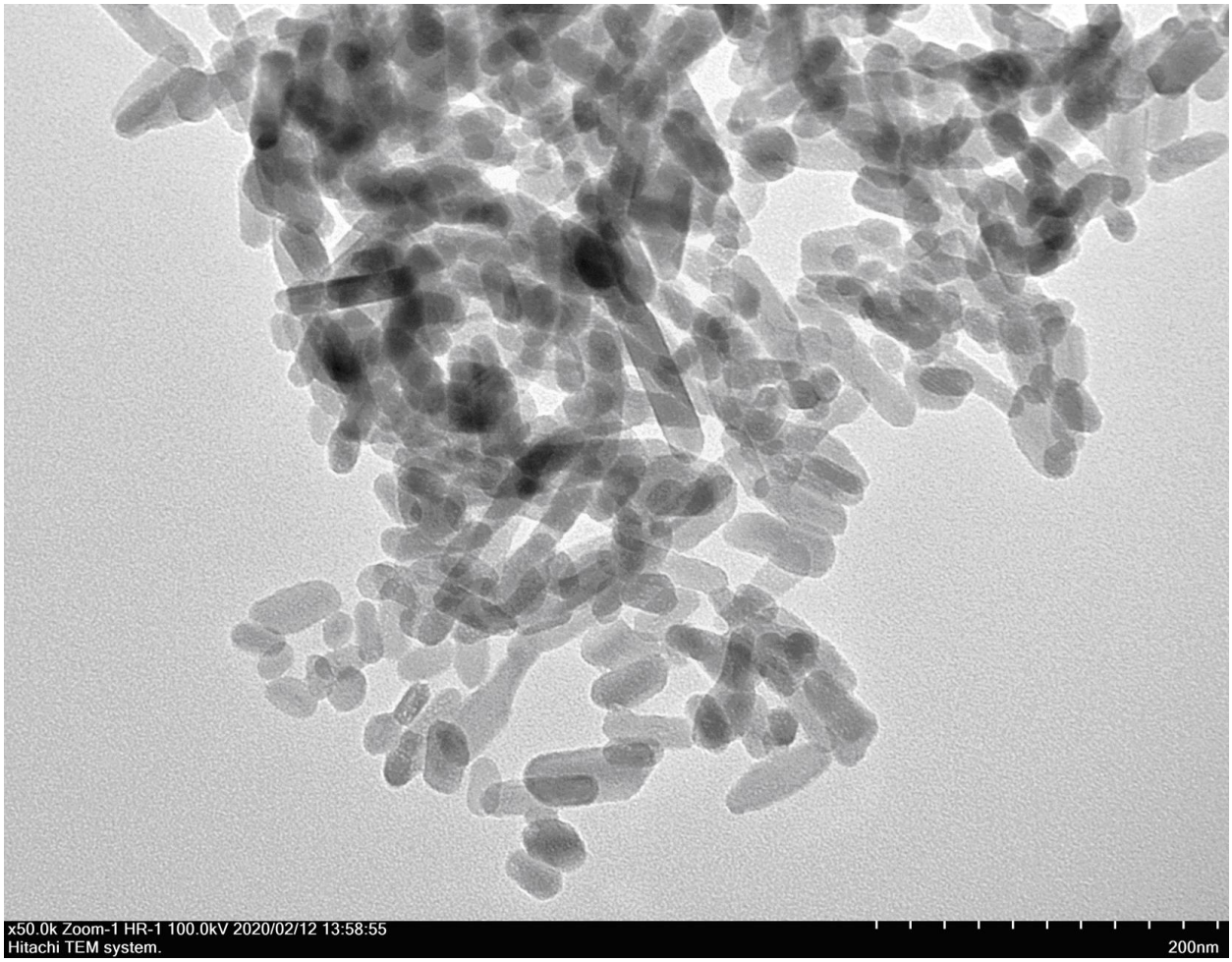

Figure S4 TEM image of HAp microcrystals obtained at 75 °C

As can be seen from the Figures S4 and S5, HAp microcrystals obtained at different temperatures had similar rod-like morphologies. However, HAp microcrystals, formed at 180 °C, were notably larger in size in comparison with HAp microcrystals, formed at 75 °C.

[1] V. V. Kachala, L. L. Khemchyan, A. S. Kashin, N. V. Orlov, A. A. Grachev, S. S. Zalesskiy and V. P. Ananikov, *Russ. Chem. Rev.*, 2013, **82**, 648.

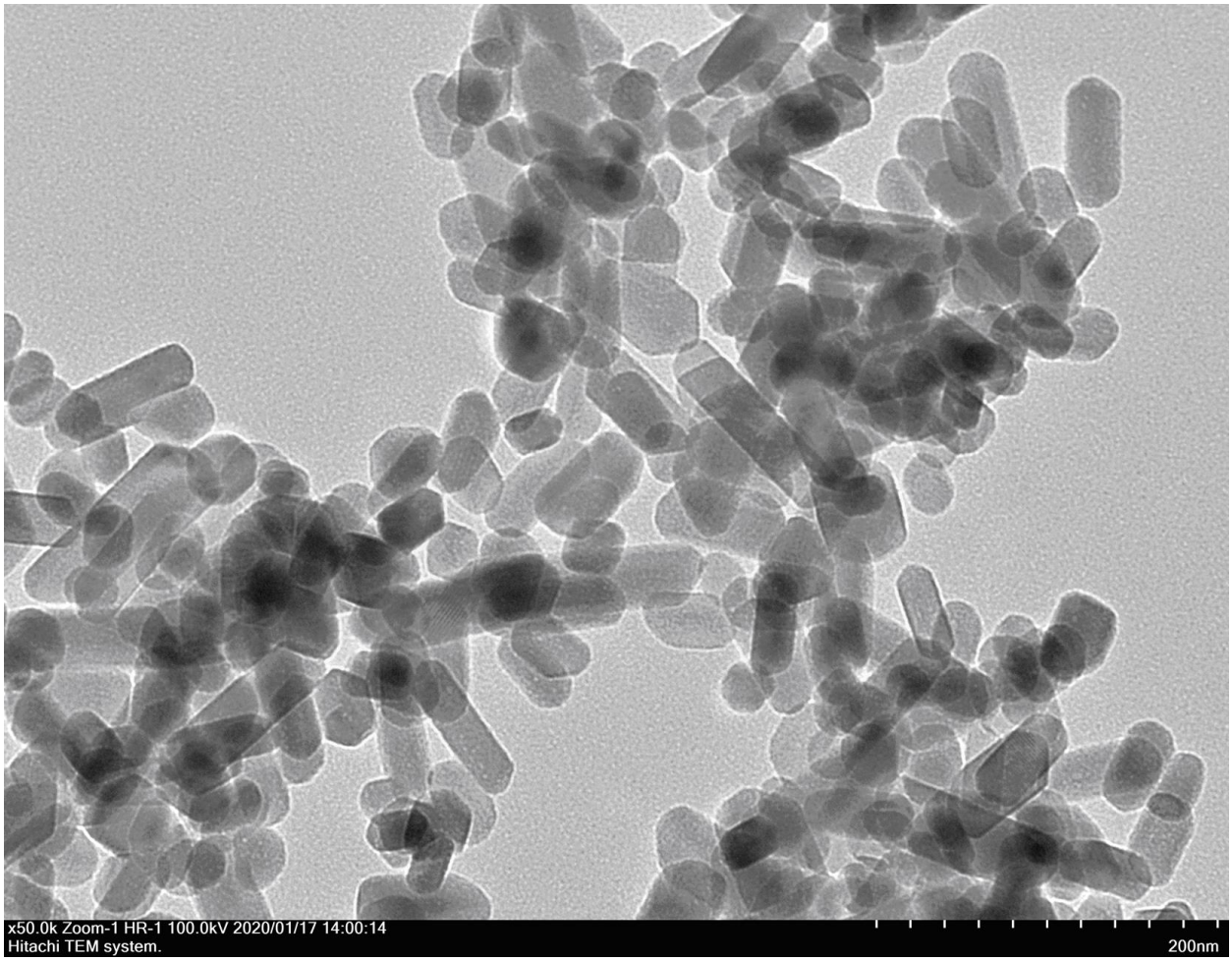

Figure S5 TEM image of HAp microcrystals obtained at 180 °C

S4. Reprinted SEM data

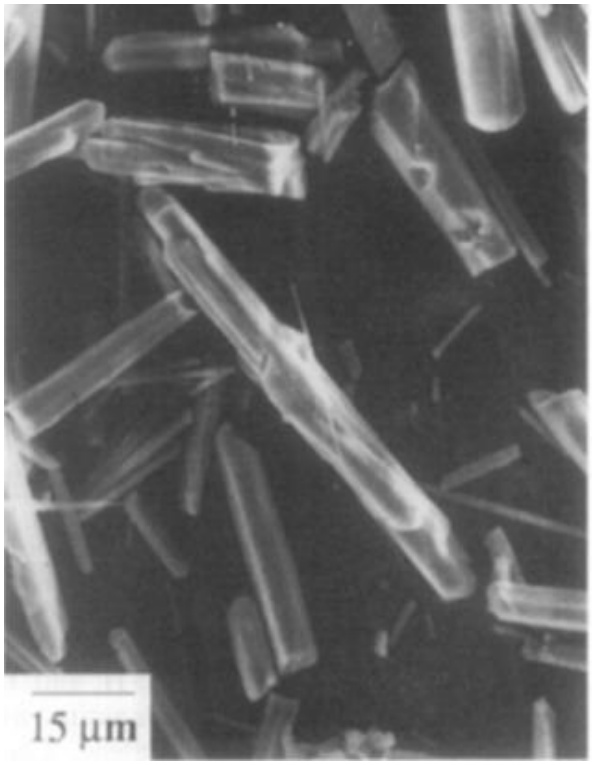

Figure S6 SEM image of plate-like morphology HAp obtained at 200 °C at pH = 11 reprinted with permission from M. Andrés-Vergés, C. Fernández-González and M. Martínez-Gallego, *J. Eur. Ceram. Soc.*, 1998, **18**, 1245. Copyright (1998) Elsevier B.V.