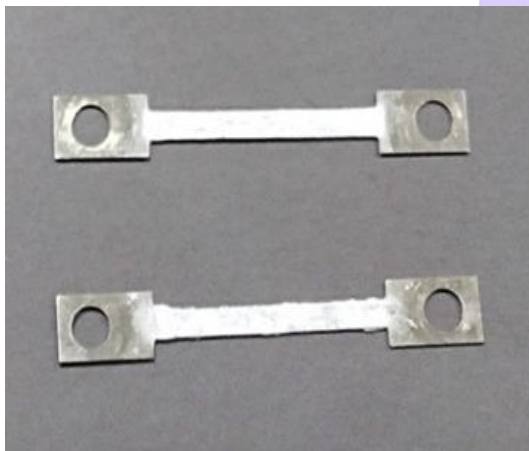




NANOSTRUCTURED COMPOSITE MATERIALS



- 1–Alg / Ch / CaP composite;
2 –Alg / Ch matrix;
3 –Alg / Ch / drug composite;
4 –Alg / Ch / CaP cement.



Application fields

Nanostructured composite materials based on calcium orthophosphates (CaP) and natural polymer (chitosan (Ch), Na alginate (Alg)) are perspective for using in practical medicine, in particular, orthopedia, traumatology and stomatology for filling bone defects.

Nanostructured apatite-biopolymer (Ch, Na Alg) composite materials on Ti and its allow substrates are perspective for enhance biocompatibility of the medical implants.

Main advantages

- Composition close to biogenic bone tissue
- Nontoxic
- Biocompatible
- Resorption ability
- Enhance bone regeneration
- Antimicrobial properties
- Mechanical properties of metal implants are joined with biocompatibility of coating material

Characteristics

The main phases of obtained products are thin – dispersed hydroxyapatite (HA), carbonate apatite, HA and TCP composite, biopolymer scaffolds. Average crystal size is 25-50 nm. Toughness of HA cement in combination with biopolymer is 2,5–5 MPa. High porosity and specific density $\sim 0,6-0,9 \text{ g}\cdot\text{cm}^{-3}$ permit drug immobilization into the scaffolds.