

14th June 2018, 15:00 s.t.

Abdullah Riaz

AG New Materials

CaTiO₃ as a potential new active bone implant material

Load-bearing pure titanium is a widespread material for passive bone implants because of its mechanical stability, corrosion resistance, good biocompatibility and low density. However, stress shielding is a major problem, titanium has poor tribological properties and it lacks bioactive functionality [1, 2]. I will talk about the possibility of surface modification of porous titanium with CaTiO₃ with respect to both the elastic properties and bioactive functionality. How CaTiO₃ is produced by field assisted sintering which is an advanced technique for the densification of powders. Moreover, how this leads to nanostructuring and possibilities of formation of lattice defects which results in pseudo piezoelectric behaviour of CaTiO₃. The measured pseudo piezoelectric constants of CaTiO₃-based nanostructures are comparable with piezoelectric constants of natural bone. This particular response of CaTiO₃ is of great interest because it may improve bone growth.

References:

- [1] F. Zhang and E. Burkel, "*Novel titanium manganese alloys and their macroporous foams for biomedical applications prepared by field assisted sintering*", (2011)
- [2] F. Zhang, Y. Quan, M. Reich, O. Kessler, and E. Burkel, "*Sintering and heat treatment of titanium alloys by pulsed electric current sintering*"

Talk: English

Slides: English

Location: Institute of Physics, Albert-Einstein-Str. 24, HS 1