

Piezoelectricity in poled hydroxyapatite ceramics.

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Streszczenie

Direct current electrical poling of textured hydroxyapatite(HAp) ceramics is reported here to exhibit weak ferroelectric-ity and pyroelectricity, but a remarkably higher (six orders of magnitude) piezoelectricity. The piezoelectric strain coefficient is an order higher than that of bone and of the same order as that of quartz crystal and uncalcified collagen in tendon. The piezoelectric charge coefficient is an order higher than bone, and three orders higher than that of tendon. Piezoelectric constants of poled HAp ceramics are high enough to have physiological relevance such as in the use of bone grafts for stimulated calcification or in energy harvesting from physiological motions. Piezoelectricity in these ceramics can be tuned by controlling texture, and poling parameters. The density of power that can be harvested from HAp ceramics is currently just one order lower than biocompatible ferroelectric ceramics such as barium titanate.

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