



## **Controlled Precipitation of Biomimetic Apatites via *in situ* Mineralization of an Organic Polymeric Matrix**

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**Summary:** The controlled and tunable precipitation of biological apatites within a polymeric support substrate

**Description:** Apatite is a naturally occurring mineral found in bone and dental tissue. Synthetic apatites are used as additives in polymeric materials for use in biological applications to inhibit the foreign body response and to promote healing. Synthetic bone graft materials incorporate calcium phosphate (CaP) to attempt to mimic natural mineralized tissue. However, the incorporated CaP phases are often synthetically derived using hydroxyapatite and tricalcium phosphate, which can be difficult for biological systems to resorb inhibiting the construction of healthy tissue. Synthetic hydroxyapatite also does not mimic the chemical and physical properties of natural biological apatites, which has varied calcium to phosphate ratios and may incorporate ions. This invention describes a method for the controlled precipitation of biological apatites within a polymeric support substrate. This method offers the predictable deposition of a mineral phase adhered to a polymeric surface to ensure homogeneity of the mineral throughout the graft. Furthermore, this approach allows for tuning of the chemical composition to resemble biological apatites found in both bone and dental tissue. The precipitation of the proper mineral phase can be initiated prior to biological incorporation or slowly matured within the biological environment. The polymeric template used in the construction of the material allows for the preparation of injectable gels or robust implantable grafts.

### **Main Advantages of this Invention**

- More closely resembles the composition of natural bone tissue
- Allows for tuning of the chemical composition
- Controlled deposition of the mineral phase

### **Potential Areas of Application**

- Biomimetic bond and dental grafts
- Coatings on biomedical devices

**ID number:** 15038

**Intellectual Property Status:** US provisional application 62/169,330.

**Opportunity:** We are seeking an exclusive or non-exclusive licensee for marketing, manufacturing, and sale of this technology.

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