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One-step fabrication of apatite-chitosan scaffold as a potential injectable construct for bone tissue engineering

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Highlights:

- all-in-one step preparation of an injectable rapid-gelling chitosan-based composite
- gelation time can be tuned by the changing the percentage of bioceramics
- size of the particles affects the porosity but not the viscoelastic properties
- compression tests indicate the characteristics of soft materials are maintained

ABSTRACT

Biom mineralization of soft scaffolds is a new venture in bone tissue engineering. This work aimed to develop a new injectable and in-situ gelling soft scaffold with chitosan and apatites through a rapid purine-crosslinking reaction. The scaffolds were fabricated by mixing chitosan, adenosine diphosphate and biominerals in an ‘all-in-one-step’ procedure. The gelling of chitosan via the crosslinker occurs in < 4 seconds as measured by impedance spectroscopy. These soft gels could

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