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[\[Image PDF \(456K\)\]](#) [\[References\]](#)**Effects of liquid phase on basic properties of α -tricalcium phosphate-based apatite cement**[Makoto ODA](#)¹⁾²⁾, [Akari TAKEUCHI](#)¹⁾, [Xin LIN](#)¹⁾, [Shigeki MATSUYA](#)³⁾ and [Kunio ISHIKAWA](#)¹⁾

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Abstract:

Effects of liquid phase on the basic properties of α -tricalcium phosphate (α -TCP)-based cement, BIOPEX[®], were investigated by employing three liquid phases: distilled water, neutral sodium hydrogen phosphate solution, and succinic acid disodium salt solution containing sodium salt of chondroitin sulfate. When mixed with neutral sodium hydrogen phosphate or succinic acid disodium salt solution, the initial setting times of the cement were 19.4 ± 0.55 and 11.8 ± 0.45 minutes respectively. These setting times were much shorter than that of distilled water, 88.4 ± 0.55 minutes. Formation of needle-like crystals typical of apatite was much faster when neutral sodium hydrogen phosphate solution was used, as compared to distilled water or succinic acid disodium salt solution. Moreover, at 24 hours after mixing, the largest amount of apatite was formed when neutral sodium hydrogen phosphate solution was used, whereas use of succinic acid resulted in the least. On the final mechanical strength of the cement, that yielded with neutral sodium hydrogen phosphate solution was the highest. In contrast, lower mechanical strength was observed—especially at the initial stage—when succinic acid sodium salt was used. It was thus concluded that α -TCP-based cement allowed accelerated transformation to apatite, and that higher mechanical strength since the initial stage was achieved when neutral sodium hydrogen phosphate solution was used as the liquid phase.

Key words:

[Apatite cement](#), [Tricalcium phosphate](#), [Apatite](#), [Phosphate](#)

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