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[\[PDF \(389K\)\]](#) [\[References\]](#)**Comparison of the Effects of Added  $\alpha$ - and  $\beta$ - Tricalcium Phosphate on the Basic Properties of Apatite Cement**[Akinari NAKAGAWA](#)<sup>1)2)</sup>, [Shigeki MATSUYA](#)<sup>3)</sup>, [Akari TAKEUCHI](#)<sup>1)</sup> and [Kunio ISHIKAWA](#)<sup>1)</sup>

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**Abstract:**

Effects of added  $\alpha$ -tricalcium phosphate ( $\alpha$ -TCP) and  $\beta$ -TCP were investigated to shed light on the setting reaction of apatite cement (AC) consisting of tetracalcium phosphate (TTCP) and dicalcium phosphate anhydrous (DCPA). Added  $\beta$ -TCP showed no reactivity, and thus resulted in extended setting time and decreased mechanical strength. In contrast,  $\alpha$ -TCP dissolved to supply calcium and phosphate ions after initial apatite crystal formation by the reaction of TTCP and DCPA. Although setting time was delayed because  $\alpha$ -TCP was involved only in the latter reaction of apatite cement, larger apatite crystals were formed due to its addition. As a result of larger apatite crystal formation, the mechanical strength of  $\alpha$ -TCP-added apatite cement increased by approximately 30%, as compared to  $\alpha$ -TCP-free apatite cement.

**Key words:**[Apatite cement](#), [Tricalcium phosphate \(TCP\)](#), [Hydroxyapatite](#)

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