

Enhancement of the hydrolysis of geranyl pyrophosphate by bivalent metal ions.

A model for enzymic biosynthesis of cyclic monoterpenes

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Hydrolysis of geranyl pyrophosphate is catalyzed by salts of Mn^{2+} and involves C-O bond cleavage.

The first order rate constants reach limiting values with $[Mn^{2+}] > 10^{-2}$ M, and the most reactive species is $GPP(Mn^{2+})_2$ at the optimum pH of 6.5-7. The products are similar to those from acid hydrolysis except that more cyclic hydrocarbons are formed in the presence of metal ions.

Hydrolysis of geranyl phosphate is inhibited, and that of citronellyl pyrophosphate is weakly catalyzed by Mn^{2+} . Other divalent metal cations catalyze the hydrolysis of geranyl pyrophosphate and the sequence of effectiveness is $Cu^{2+} > Mn^{2+} > Zn^{2+} > Co^{2+} < Mg^{2+} \sim Ca^{2+}$. © 1981.