Immobilized Agents of Tannase Effective for Galloylation of Alcohols

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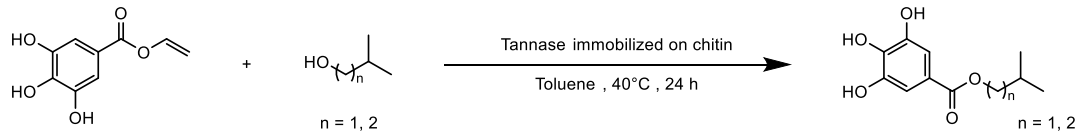
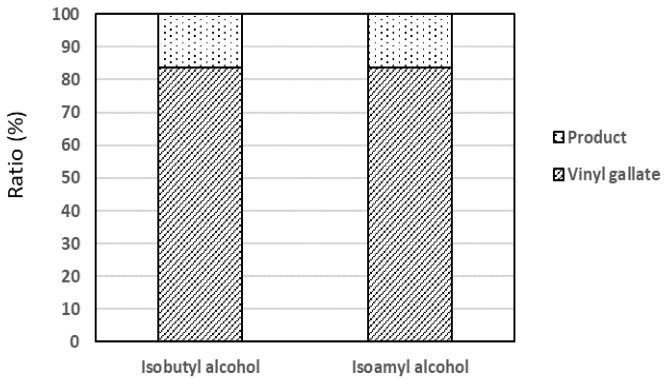
Tannase, which catalyzes the hydrolysis of the gallic acid esters like tannins to the corresponding alcohols and gallic acid,[1] has been utilized as an enzyme for food processing in the beverage industry.[2] However, practical enzymatic galloylation of alcohols using tannase is less focus in previous studies. We have investigated the enzymatic galloylation of alcohols in organic solvent using immobilized tannase. Gallic acid esters are useful as antioxidants. Now, we will report that galloylation of alcohols with galloyl donors in the presence of tannase immobilized on chitin or chitosan proceeded to afford the corresponding gallic acid esters.

Thus, the reaction of isobutyl alcohol and isoamyl alcohol with vinyl gallate in the presence tannase, which was immobilized on chitin, in toluene for 24 h at 40°C (Scheme 1). The results are shown below.



Scheme 1



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2) M. F. Ramadan In Enzymes in Food Biotechnology: Production, Applications, and Future Prospects; K. Mohammed Ed., Elsevier: 2019; cp. 24, pp. 419-432.