

Effect of Reaction Parameters on the Lipase-Catalyzed Kinetic Resolution of (RS)-Metoprolol

ABSTRACT

Racemic metoprolol is a selective β 1-blocker, which is used in cardiovascular disease treatment. It has been found that (S)-metoprolol has a higher affinity to bind the β -adrenergic receptor compared to (R)-metoprolol. Moreover, the regulatory authorities' high market demand and guidelines have increased the preference for single enantiomer drugs. In this work, the lipase-catalyzed kinetic resolution of racemic metoprolol was performed to obtain the desired enantiomer. The type of lipase, acyl donor, and solvent were screened out. This was achieved by *Candida antarctica* B lipase-catalyzed transesterification of racemic metoprolol in hexane and vinyl acetate as the solvent and an acyl donor, which gave maximum conversion of (S)-metoprolol (XS) of 52%, enantiomeric excess of substrate, (ees) of 92% and product (eeP) of 90% with enantiomeric ratio (E) of 62. This method can be considered as green chemistry, which can be applied to produce other enantiopure beta-blockers.