GS4-5 Asymmetric phase-transfer catalytic reaction including radical intermediates: study of the reaction mechanism and its application

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We have already found a highly enantioselective catalytic alkylation of cyanoacetates using a chiral phase-transfer catalyst, and applied the method for the synthesis of chiral 3,3-disubstituted oxindoles.[1] In the course of the investigation, we have also found that phase-transfer catalytic reaction of 3-substituted oxindoles in air afforded the corresponding 3-hydroxy derivatives, and high enantioselectivity up to 93% ee.[2] Since it was suggested that a radical intermediate added to molecular oxygen in the reaction process, the reaction mechanism was considered to be different from that in the normal phase-transfer catalytic reaction. Thus the reaction mechanism was speculated and applied to other radical reactions. We will present these results.