BIMBOL as a multifunctional chiral catalyst in synthesis of both enantiomers of glutamic acid.

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Both enantiomers of glutamic acid are synthesized via 1,4-additions of achiral glycine and dehydroalanine Schiff base Ni(II) complexes using (S)-3,3'-bis(diphenylhydroxymethyl)-2,2'-dihydroxy[1,1’]binaphthalenyl (BIMBOL) as catalyst.

It was shown that (S)- and (R)-BIMBOLs were efficient PTC catalysts of asymmetric procedure of Michael addition of acrylic esters to an achiral Ni-PBP-Gly complex (1) and Michael addition of malonic esters to dehydroalanine complex Ni-PBP-∆-Ala (2). The addition reactions proceed with high chemical yields within 5-7 minutes in the presence of 10% mol of BIMBOL or its tetrapotassium derivative. (R)-Glutamic acid with 68% enantiomeric excess for path 1 and (S)-glutamic acid with 86% ee for path 2 was obtained after decomposition of the complexes 3 and 4 with HCl.