

# STEREOSELECTIVE MICHAEL ADDITION OF ALDEHYDES TO HETEROCYCLIC NITROALKENES CATALYZED BY HYBRID PEPTIDE-THIOUREA CATALYSTS

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New bifunctional hybrid peptide-thiourea catalysts were prepared, which combine the advantages of short dipeptide catalysts and chiral thiourea derivatives. They use both covalent and non-covalent activation, so they could allow the enamine formation from the carbonyl functionality by the N-terminal proline moiety and the activation of the nitroolefins by hydrogen bonding with thiourea. We assessed applicability of these catalysts in solvent-free conditions (ball mill) and in solvents. Compared to the mechanical grinding in a ball mill, the PTU1 catalyst proved to be more efficient in solution, which gave us interesting chiral Michael adducts containing various heterocycles in high yields (up to 95%) and high diastereo- and enantiomeric purities (d.r. to 1:13 and ee to 95%).

