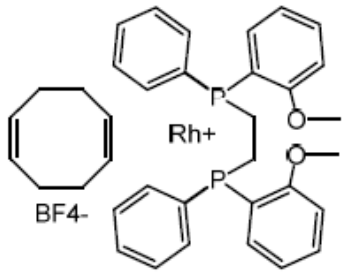
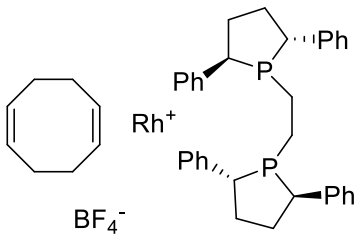
## CLAIMS

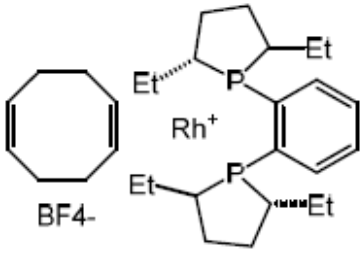
1. Method for synthesis of (S)-6-Acetyloxy-N-tert-butoxycarbonyl-tryptophan (HDP 30.2550) or (S)-6-hydroxytryptophan, wherein said method comprises at least one step of enantiomer-selective hydrogenation of an olefinic amino acid precursor compound by use of at least one chiral catalyst, wherein said chiral catalyst is a compound selected from the group consisting of compound HDP 30.2758, (R,R)-Et-DUPHOS ($BF_{4-}$), (R,R)-DuPhos-Ferrocene ($BF_{4-}$), (R,R)-DuPhos-Ferrocene-$Et_2$ ($BF_{4-}$), (R,R)-DuPhos-Alkyl ($CF_3SO_3$), and (R,R)-Phenyl-DuPhos- Alkyl ($BF_{4-}$):



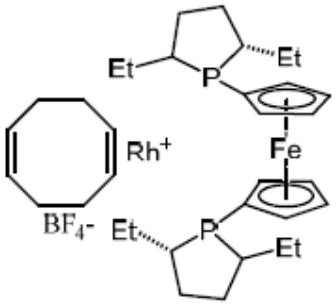

**HDP 30.2758**



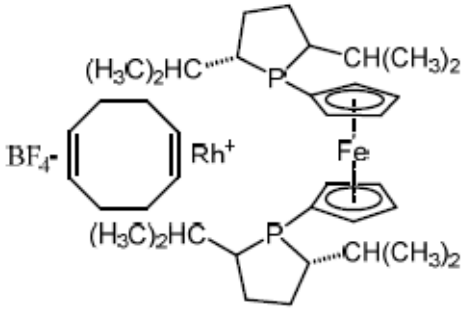

**(*R*,*R*)-Phenyl-DuPhos-Alkyl ($BF_4^-$)**



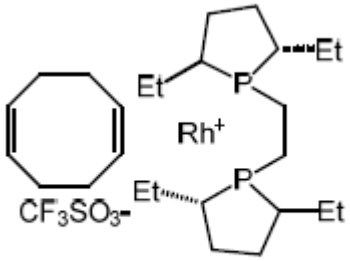

**(R,R)-Et-DUPHOS ($BF_4$-)**




**(R,R)-DuPhos-Ferrocene ($BF_4$-)**

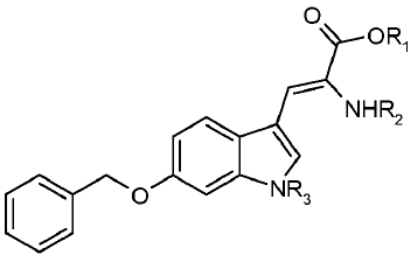



**(R,R)-DuPhos-Ferrocene-$Et_2$ ($BF_4$-)**

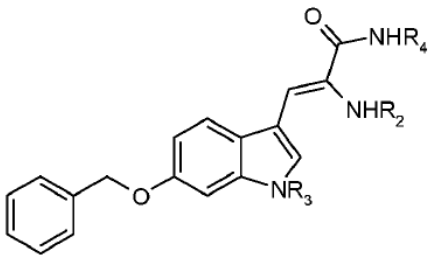



**(R,R)-DuPhos-Alkyl ($CF_3SO_3$-)** ,

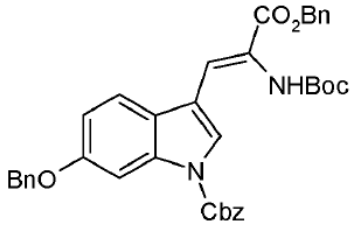
and wherein said olefinic amino acid precursor is a dehydroamino acid compound selected from the group consisting of compounds I, II and III:




I




II




III

wherein

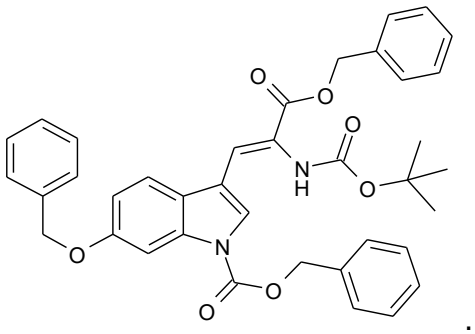
R1 is selected from: H, alkyl, alkenyl, aryalkyl optional substituted,

R2 is selected from: Boc, Cbz, N protecting groups,

R3 is selected from: Boc, Cbz, N protecting groups,

R4 is an amino acid residue.

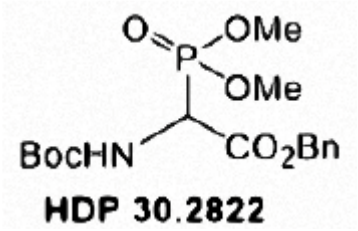
2. The method according to claim 1, wherein said olefinic amino acid precursor is compound HDP 30.2824:




**HDP 30.2824**

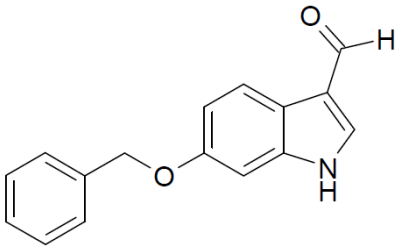
3. The method according to any of claims 1 - 2, wherein said chiral catalyst is compound HDP 30.2758 or (R,R)-Et-DUPHOS ($BF_{4-}$).

4. The method according to any of claims 1 - 3, wherein said olefinic amino acid precursor is synthesized by use of compound HDP 30.2822.



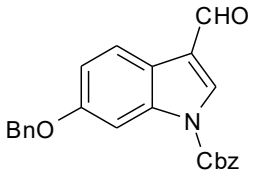

**HDP 30.2822**

5. The method according to claim 4, wherein said olefinic amino acid precursor is further synthesized by use of compound B.

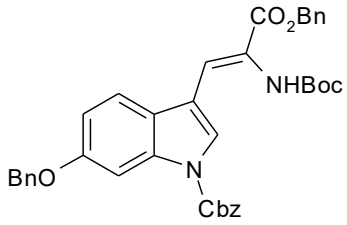



**Compound B**

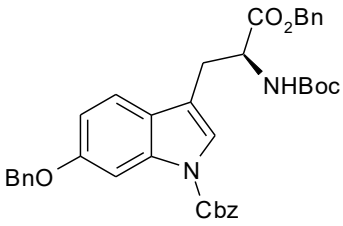
6. The method according to any of claims 1 – 5, wherein said method comprises the use of at least one starting or intermediate compound selected from the group consisting of



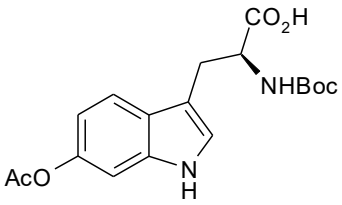

**HDP 30.2803**



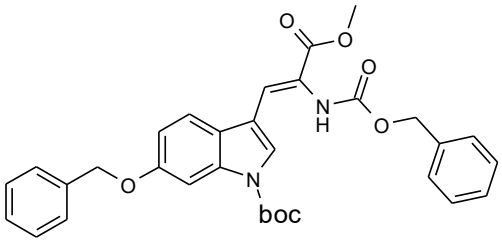

**HDP 30.2824**



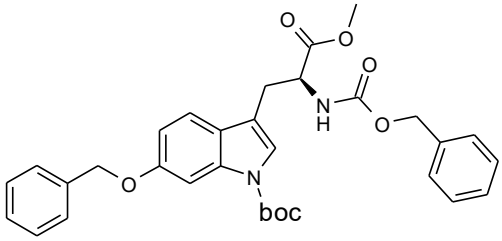

**HDP 30.2826**




**HDP 30.2550**

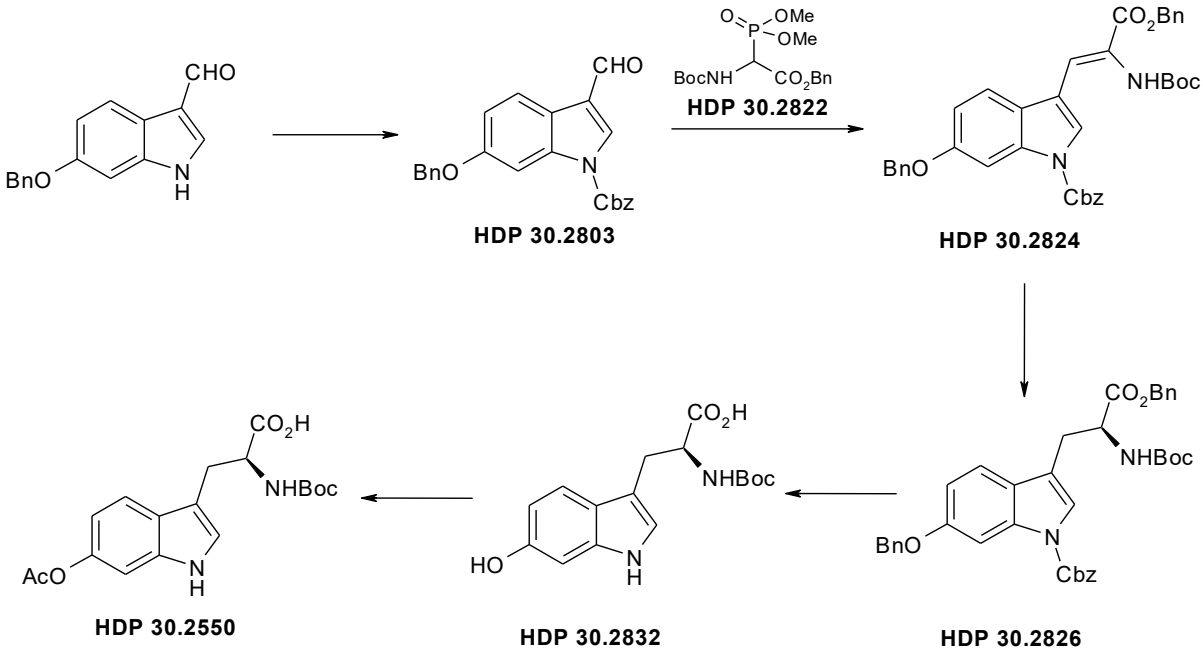



**HDP30.2739**

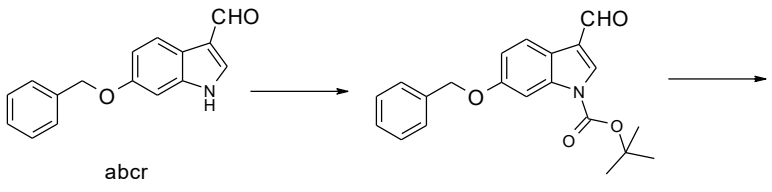



**HDP30.2760**

7. The method for synthesis of (S)-6-Acetyloxy-N-tert-butoxycarbonyl-tryptophan **(**HDP 30.2550) according to any of claims 1 – 6, wherein said method comprises at least the following steps:



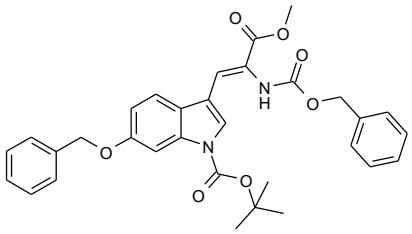

8. The method for synthesis of (S)-6-hydroxytryptophan according to any of claims 1 – 6, wherein said method comprises at least the following steps:



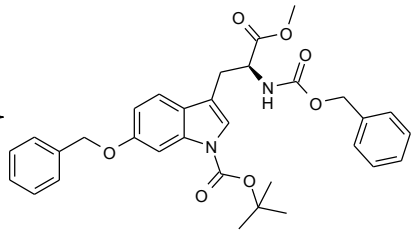

abcr



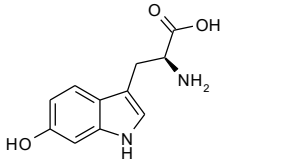

HDP30.2738




HDP30.2739

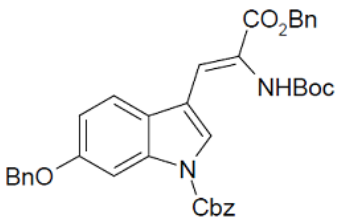



HDP30.2760

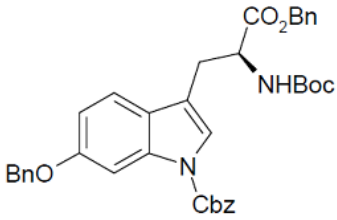



(S)-6-hydroxy-tryptophan

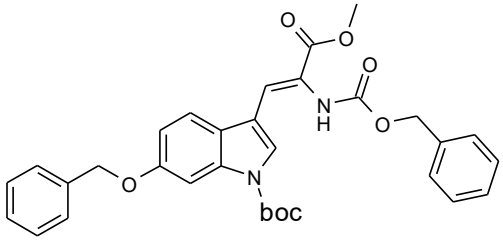
9. Compounds selected from the group consisting of:



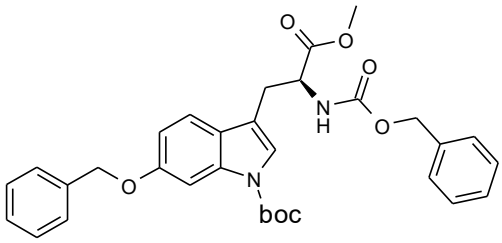

**HDP 30.2824**




**HDP 30.2826**

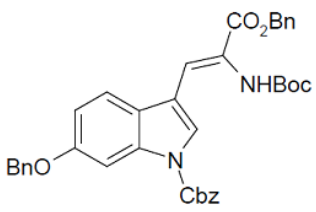


HDP30.2739

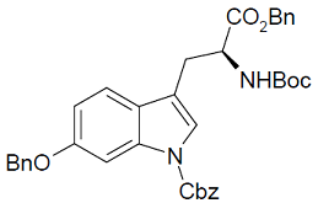


HDP30.2760

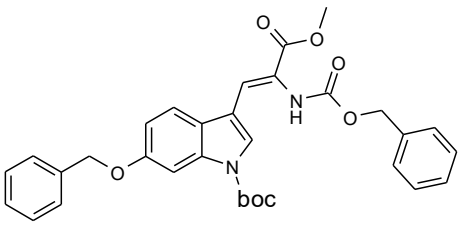
10. Use of any of the precursor compounds



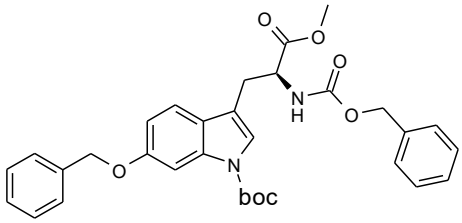
HDP 30.2824



HDP 30.2826



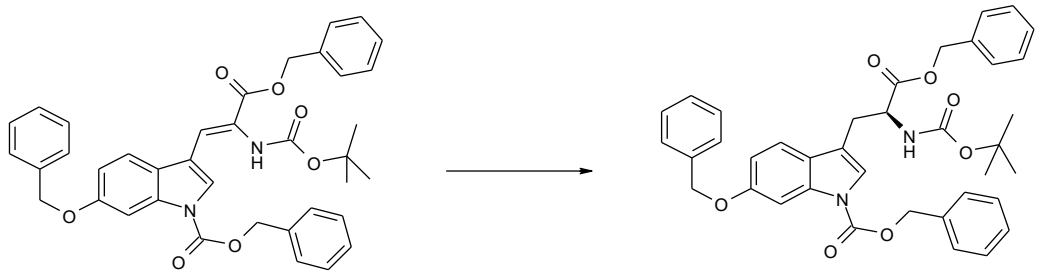
HDP30.2739



HDP30.2760

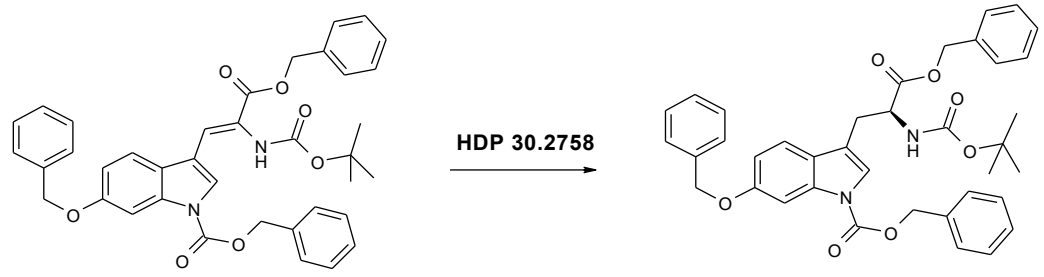
for synthesis of amanitin or amanitin derivatives or amatoxin-drug conjugates, wherein said amatoxin-drug conjugate optionally comprises a linker.

11. Use of a compound selected from the group consisting of compound HDP 30.2758, (R,R)-Et-DUPHOS ($BF_{4-}$), (R,R)-DuPhos-Ferrocene ($BF_{4-}$), (R,R)-DuPhos-Ferrocene-$Et_2$ ($BF_{4-}$), (R,R)-DuPhos-Alkyl ($CF_3SO_{3-}$), and (R,R)-Phenyl-DuPhos- Alkyl ($BF_{4-}$) as catalyst for hydrogenation in the following reaction:



**HDP 30.2824** **HDP 30.2826**

12. Use of cyclooctadiene-1,5-[(R,R)-DIPAMP] rhodium tetrafluoro-borate (HDP 30.2758) as catalyst for hydrogenation in the following reaction:




**HDP 30.2824** **HDP 30.2826**