Processes for Preparing Chiral 3,3-Disubstituted Oxindoles

IITM Technology Available for Licensing

Problem Statement

- Traditional methods for chiral 3,3-disubstituted oxindole synthesis are **harsh and limited in scope**, hindering pharmaceutical applications.
- Diazo compounds, commonly used precursors, **pose safety risks due to instability, limiting their practical use.** Few successful methods exist for capturing chiral Csp3-Pd intermediates, **crucial for efficient synthesis.**
- Hence, a one-step, enantioselective synthesis method for **chiral 3,3-disubstituted oxindoles from versatile starting materials** is needed to overcome above mentioned limitations and meet pharmaceutical demands.

Technology Category / Market

Categories: Drugs & Pharmaceutical Engineering | Chemistry & Chemical Analysis

Industry: Chemical Synthesis

Application: Pharmaceutical Synthesis

Market: The Chiral Chemical market size was valued at **USD 58.82 Billion in 2021** and is predicted to reach **USD 150 Billion by 2030** with a **CAGR of 9.8%** from 2022-2030.

Technology

The instant invention introduces a novel **method combining transition metal catalysis** with enantioselective reactions, driving advancements in synthetic chemistry.

Key Features / Value Proposition

- Guarantees the **production** of optically pure chiral compounds crucial for **pharma use**.
- **Utilizes safer N-tosyl hydrazones** instead of hazardous diazo compounds, expanding substrate options & **enhancing safety in Lab**.
- Incorporates a precise combination of palladium catalyst, ligand, base, and silver salt additives to **ensure high yields and selectivity**.
- Provides specific parameters for temperature, reaction time, and reagent concentrations, **enabling reproducibility and scalability**.
- Simplifies the synthetic pathway with a **one-step process, saving time and resources**.
- **Facilitates the synthesis of valuable chiral building blocks** for drug development.
- Offers **cost-effective** approach using accessible starting materials.

Intellectual Property

IITM IDF No.: **2445** | IP No.: **463317 (Granted)**

TRL (Technology Readiness Level)

TRL-3: Proof of Concept

Research Lab

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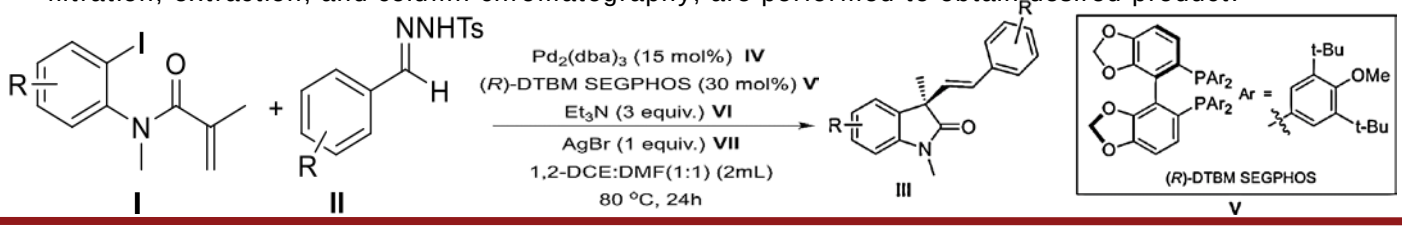
A process for preparing a compound of **formula (III)** the process comprising: reacting a compound of **formula (I)** with compound of **formula (II)** wherein 'R' and 'R1' are independently selected from a group comprising hydrogen, alkyl group, alkoxy group and halo group; wherein the ligand is (R)-DTBM SEGPHOS (compound of **formula V**).

- The reaction is conducted in a **solvent system** comprising dimethylformamide (DMF), dichloromethane (DCM), dichloroethane (DCE), and **a co-solvent system** DCE:H2O, with a **1:1 ratio of 1,2-dichloroethane and dimethylformamide.**
- Optimal reaction conditions involve a temperature range of **70°C to 90°C for 24 hours**.
- Following the reaction, isolation and purification steps, including solvent addition, quenching, filtration, extraction, and column chromatography, are performed to obtain desired product.



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