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DEPARTMENT OF
SCIENCE & TECHNOLOGY
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PENDING

(IN202311073176) Hexafluoroisopropanol (hfip) mediated hydrofunctionalization of ynamides and methods for the preparation thereof

NEED

Synthetic processes for bioactive molecules often suffer from poor selectivity and high waste generation. This inefficiency leads to low yields and high purification costs in pharmaceutical and specialty chemical production. What if molecular precision could be achieved in a single-pot reaction?

TECHNOLOGY OVERVIEW

A regio- and stereo-selective process uses hexafluoroisopropanol (HFIP) to activate ynamides for hydrofunctionalization with O-, S-, and Se-nucleophiles, yielding α-functionalized enamides. This method enables high atom economy and avoids external catalysts or harsh conditions, ideal for drug discovery and material chemistry.

TECHNOLOGY KEY FEATURES

HFIP-based activation; no metal catalyst; ambient temperature; works with various nucleophiles; delivers high stereoselectivity; compatible with diverse EWG/R/Z groups; 12–16 hr reaction window; atom-economic single-pot process

MARKET ANALYSIS

India fine chemicals market expected to grow at 11.5% CAGR, reaching USD 12.6B by 2033. Global demand for green, selective synthesis in pharma and material science drives innovation in process chemistry. [Sources: Expert Market Research, McKinsey]

Target Industries

Target Industries: pharmaceutical synthesis platforms, fine and specialty chemical producers and/or green chemistry technology integrators, academic and industrial labs focused on stereo-controlled compound libraries and/or IP-driven small molecule manufacturing pipelines.

AT A GLANCE

SDGs: 3 (Good Health & Well-being), 9 (Industry, Innovation & Infrastructure), 12 (Responsible Consumption & Production)

Read more here

Technology is available for licensing/ co-development.

Reach out to Prof. Deepak Chitkara, Coordinator, BITS Technology Enabling Centre,
BITS Pilani Contact Details: tec.bits@pilani.bits-pilani.ac.in, 91 1596-255913

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