

Complimentary and personal copy

www.thieme.com

SYNFACTS Highlights in Chemical Synthesis

This electronic reprint is provided for non-commercial and personal use only: this reprint may be forwarded to individual colleagues or may be used on the author's homepage. This reprint is not provided for distribution in repositories, including social and scientific networks and platforms.

Publishing House and Copyright:
© 2025 by
Georg Thieme Verlag KG
Oswald-Hesse-Straße 50
70469 Stuttgart
ISSN 1861-1958

Any further use
only by permission
of the Publishing House

 **Thieme**

spiroannulation

spirodihydroquinolines

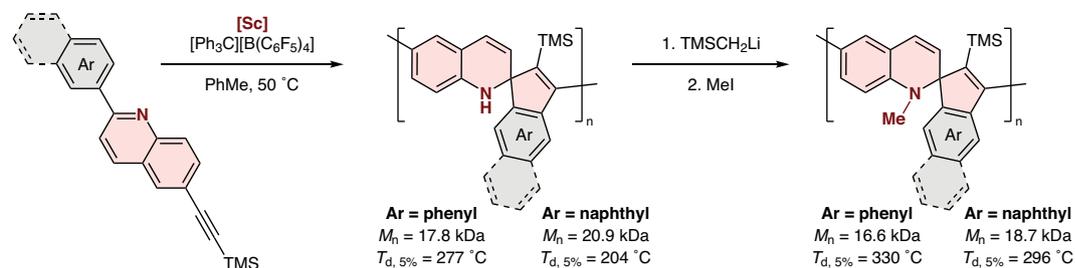
scandium catalyst

spirocenter

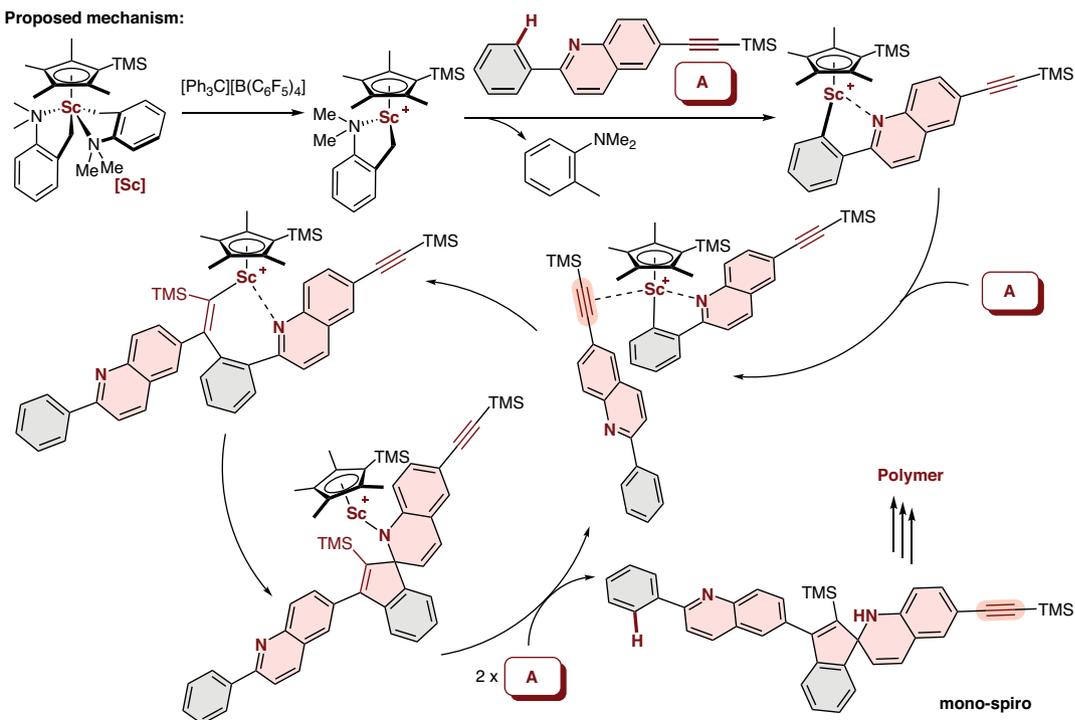
J. SHAO, L. HUANG, S.-J. LOU, A. OHNO, Y. MA, YAMADA, M. NISHIURA, T. MURAHASHI,
Z. HOU* (RIKEN CENTER FOR SUSTAINABLE RESOURCE SCIENCE AND RIKEN CLUSTER FOR
PIONEERING RESEARCH, SAITAMA, JAPAN)

Synthesis of Rigid Stepladder Polymers via Scandium-Catalyzed Polyspiroannulation of Quinoline with Alkyne
J. Am. Chem. Soc. **2025**, *147*, 1416–1420, DOI: 10.1021/jacs.4c15046

Creating Spirocenters in Polymerization



Proposed mechanism:



Significance: Polymers of 3D structures having intrinsic microporosity hold promise for applications such as gas separation and sensing technology. Here, a scandium-catalyzed spiroannulative polymerization is accomplished, producing macromolecules of spirodihydroquinoline as a repeat unit.

Comment: A half-sandwich scandium catalyst is found to promote the dearomative spiroannulation of 2-arylquinolines by reacting with internal alkynes. The polymerization is then realized using quinolines bearing both aryl and ethynyl substituents.