

Synthesis, reactions and applications of pyrimido[2,1-*a*]isoquinolines derived from 1,2-difunctionalized pyrimidine derivatives (Part V)

Moustafa A. Gouda^{1,2*}, Hanan I. Althagbi³, Nourah A. Al Zahrani³, Ameen A. Abu-Hashem⁴, Tahah A. Ameen⁴ and Alshymaa Z. Al-Mokadem⁵

¹Department of Chemistry, College of Science, Taibah University, Al-Madinah Al-Munawarah 30002, Saudi Arabia

²Department of Chemistry, Faculty of Science, Mansoura University, Mansoura 35516, Egypt

³Department of Chemistry, College of Science, University of Jeddah, Jeddah 21959, Saudi Arabia

⁴Department of Physical Sciences, Chemistry Division, College of Science, Jazan University, P.O. Box.114, Jazan 45142, Saudi Arabia

⁵Department of Chemistry, College of Science, Jouf University, Sakaka 72341, Saudi Arabia

ABSTRACT Pyrimido[2,1-*a*]isoquinolines (Py-[2,1-*a*]isoQs) are a class of heterocyclic compounds that have gained significant attention in the fields of organic chemistry, medicinal chemistry, and materials science. (Py-[2,1-*a*]isoQs) consist of a pyrimidine ring fused to an isoquinoline ring. This unique structure imparts distinct electronic and steric properties, making them attractive for various applications. They have been explored as potential therapeutic agents for treating cancer, and infectious diseases; their planar structure and conjugation make them suitable for applications in organic electronics, such as organic light-emitting diodes. (Py-[2,1-*a*]isoQs) and have been investigated as ligands for transition metal reactions. This review offers an in-depth analysis of the synthesis strategies and chemical behavior of pyrimido[2,1-*a*]isoquinolines derived from 1,2-difunctionalized pyrimidine derivatives. It examines their reactivity and highlights recent advancements in the field, providing valuable insights into their evolving applications and significance in heterocyclic chemistry.

KEY WORDS Sonogashira coupling, Isoquinoline, Suzuki-Miyaura-coupling reactions, Py-[2,1-*a*]isoquinoline, Pyrimidine.

How to cite this article: Gouda, M.A., Althagbi, H.I., Al Zahrani, N.A., Abu-Hashem, A.A., Ameen, T.A., and Al-Mokadem, A.Z. Synthesis, reactions and applications of pyrimido[2,1-*a*]isoquinolines derived from 1,2-difunctionalized pyrimidine derivatives (Part V), *Indian J. Heterocycl. Chem.*, 2025, 35, 1-17, <https://doi.org/10.59467/IJHC.2025.35.1>