

Diastereoselective Synthesis of Cyclopentene Spiro-rhodanines Containing Three Contiguous Stereocenters via Phosphine-catalyzed [3+2] Cycloaddition or One-pot Sequential [3+2]/[3+2] Cycloaddition

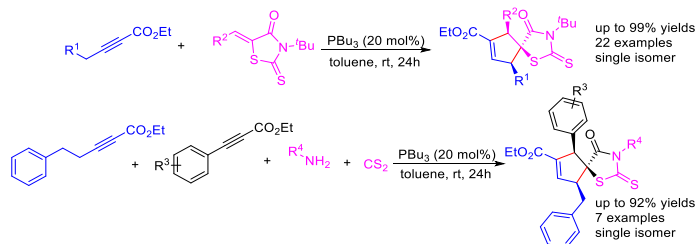


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Abstract

Two different diastereoselective phosphine-catalyzed cascade reactions to form cyclopentene spiro-rhodanine scaffolds are described. In the first approach, alkynoate derivatives and 5-arylidene-3-(tert-butyl)-2-thioxothiazolidin-4-one react in the presence of PBu₃ through a [3+2] cycloaddition to afford 5-spiro-cyclopentene-rhodanines in high yields (up to 99%) and with excellent diastereoselectivities [20:1 diastereomeric ratio (dr)]. In the second approach, the sequential [3+2]/[3+2] annulation reaction of ethyl 5-phenylpent-2-ynoate, substituted arylolefinylpropiolates, amines, and carbon disulfide with phosphine catalysis produces the corresponding monospirocyclic rhodanine products in good yields (up to 92%) and with excellent diastereoselectivities (up to 20:1 dr) (Scheme 1)



Speaker Publications:

1. "Synthesis of Methylene Cyclopropane-Fused Chromenes and Dihydroquinolines by Sequential [4 + 2]- and [1 + 2]-Annulation Organic & Biomolecular Chemistry (2020) Vol 18, Issue 7
2. "A regioselective Synthesis of Substituted Pyrazolines via a Cascade Annulation of Huisgen Zwitterion with α -Cyano- α,β -unsaturated Ketones Under Solvent-free Heating Conditions / ChemistrySelect Vol 4 (2019) - Issue 35
3. "Nitrogen-Containing Lewis Base Catalyzed Regioselective Cyclization of Allene Ketones or α -Methyl Allene Ketone with Unsaturated Pyrazolones Organic & Biomolecular Chemistry Vol 17 Issue 12(2019) .
4. Efficient Synthesis of 4,7-Dihydro-1H-oxepino[2,3-c]pyrazoles by Potassium Carbonate Promoted [4+3] Annulation of Crotonate-Derived Sulfur Ylides with Benzylidenepyrazolones/ Synthesis/ Vol 51 Issue 10(2019).
5. K₃PO₄-promoted domino reactions: Diastereoselective synthesis of: Trans -2,3-dihydrobenzofurans from salicyl N-tert-butanesulfinyl imines and sulfur ylides/ RSC Advances/ Vol 9 Issue 21(2019) .

[7th International Conference on Organic and Inorganic Chemistry](#); Webinar – June 18-19, 2020.

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Biography:

Zhiwei Miao has completed his PhD at the age of 33 years from Tsinghua University and postdoctoral studies from ETH Zürich Chemistry and Applied Biosciences. He is a Chemistry Professor in Nankai University. He has published more than 70 papers in reputed journals and his research field focus on organic phosphorus chemistry and asymmetric synthesis.