Phosphine-catalyzed regio- and stereo-selective hydroboration of ynamides to (Z)-β-borylenamides†

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Abstract

We report a tri-n-butyl phosphine catalyzed regio- and stereo-selective hydroboration of ynamides to yield (Z)-β-borylenamides in good yields. Surprisingly, a formal cis addition to the triple bond was observed as confirmed by NMR and X-ray crystallography. 31P NMR studies suggest that a zwitterionic vinylphosphonium intermediate is key in the mechanism. The resulting products were further transformed to β-CF₃ enamides via stereoretentive trifluoromethylation.