The gold(I) effectively catalyzed Claisen-type rearrangement of cyclic 8-aryl-2,7-enyn-1-ols produces unsaturated spirocycles as a mixture of diastereomers. Chemoselective hydrogenation of the resulting diastereomeric isomers using Pd/C and diphenylsulfide as a catalyst poison under an atmosphere of hydrogen generates saturated spirocyclicketones in good yields. Heterospirocyclic analogscan also be obtained from cyclic 8-aryl-2,7-enyn-1-ols bearing a N-sulfonamide or an oxygen atom linkages in the tether and the gold(I) catalyst.
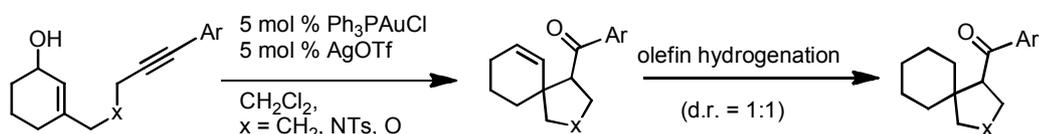
(Z)-8-Aryl-5-tosyl-5-azaoct-2-en-7-yn-1-ols were cycloisomer- ized to the corresponding cis-3-acyl-4-alkenyl-pyrrolidines when treated with a catalytic amount of Ph$_3$PAuCl/AgOTf in CH$_2$Cl$_2$. The reaction proceeded via attack of the hydroxyl group onto the gold-activated alkynes followed by [3,3]-sigmatropic rearrangement to generate cis-3-acyl-4-alkenylpyrrolidines in good yields. This transformation can be applied to synthesis of cis- and trans-3-acyl-4-alkenylcyclopentanes from (Z)- and (E)-8-aryloct-2-en-7-yn-1-ols, respectively.
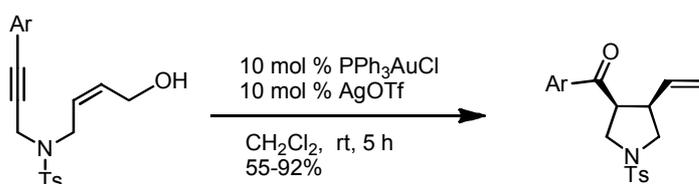
A series of structurally simple dipolar light-harvesting organic dyes featuring 1,3-cyclohexadiene in the aromatic π framework for dye-sensitized solar cells has been synthesized and characterized. The highest conversion efficiency of the DSSCs based on these dyes can reach up to 4.4%.