An Immobilized Cobalt Complex for Alkyne-Tagged Peptide Enrichment

Significance: A ‘catch-and-release’ protocol for the enrichment of alkyne-tagged biomolecules using a resin-supported phosphine cobalt carbonyl complex in aqueous media was developed. The reaction of a PS-PEG resin (TentaGel) supported cobalt complex 7 with a propargyloxycarbonyl-functionalized peptide 6 (prepared from a dipeptide 1 over four steps) proceeded in 30% EtOH/HEPES buffer solution to give the corresponding dicobalt alkyne complex 8. The following Nicholas-type reaction–decarboxylation sequence of 8 afforded the free amine 4 in 77% yield.

Comment: The reaction of the alkyne-tagged dipeptide 6 with the solid-supported cobalt complex 7 was performed under high-dilution conditions (50 μM of 6). After the complexation of 6 with 7, the resulting polymeric peptide complex was treated with 5% TFA to release the free amine 4 as a single product, where an alkyne 6 was not detected in the solution by mass spectrometry.