

Suwimon Suebka 2012: Synthesis of Acid Labile Reagent for the Purification of Specific tRNAs. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Mr. Pitak Chuawong, Ph.D. 80 pages.

Biomolecules are crucial building blocks for all living organisms on this planet. The purification of biomolecules such as tRNAs is important for an investigation of their chemical properties and structural diversities. Consequently, it is necessary to develop an efficient purification technique as well as to look for novel bioconjugation systems in order to facilitate biomolecule manipulation. The study of aminoacyl-tRNAs is one of our main interests. The desired tRNA could be separated from a pool of tRNAs using a specific activity of an enzyme called aminoacyl-tRNA synthetase (AARS) in order to provide correctly charged aminoacyl-tRNA. The resulting system could be applied to immobilized-metal affinity chromatography.

In this study, acid labile reagent for the purification of specific tRNA was synthesized. The synthesis consisted of two parts; 1) synthesis of a conjugate molecule with terminal alkyne, 2) synthesis of a compound with terminal azido group, and 3) the utilization of click chemistry. Another terminus of azido conjugate molecule was coupled with histidylhistidine in order to facilitate the immobilized-metal affinity chromatography. The synthesis of terminal alkyne with active carbonate was proven to be problematic due to low stability of resulting carbonate functional group. The conjugate molecule with azido group was successfully synthesized with reasonable yield. The synthetic details as well as efforts toward the development of this acid labile reagent are presented herein.

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