

Área: ANA

Synthesis and analysis of tetrapeptides by LC-MS/MS

Carlos Henrique Tenório de Lima (PG),¹ Évelin Lemos de Oliveira (PQ),² Jean Halison de Oliveira (PQ),² Valquíria de Moraes Silva Ribeiro (PQ),¹ Eduardo César Meurer (PQ),¹ Leda Maria Saragiotto Colpini (PQ)¹.

elemosoliveira01@gmail.com; carlos1@ufpr.br

¹Universidade Federal do Paraná – Campus Avançado de Jandaia do Sul, Jandaia do Sul - PR; ²Universidade Estadual de Maringá, Maringá – PR.

Keywords: *Peptide Synthesis, Thionyl Chloride, Mass Spectrometry, Zwitterions, Bioactivity.*

Highlights

Peptide synthesis using thionyl chloride. In this work, amino acids were activated non-selectively with SOCl_2 , and the use of Fmoc-Cl as a protective group improved selectivity. Mass spectrometry (LC-MS/MS) confirmed the formation of tetrapeptides, which have potential biotechnological applications.

Abstract

The synthesis of peptides is a highly relevant field in chemistry and biotechnology, especially for pharmaceutical and nutraceutical applications. This work proposes the production of peptides through reactions with thionyl chloride (SOCl_2), using amino acids as reagents in a bottom-up approach. The methodology included the activation of carboxylic groups to form acyl chlorides and their subsequent reaction with amines, followed by analysis using mass spectrometry (LC-MS/MS). Despite the high reactivity of acyl chlorides, the results indicated challenges in the formation of intermediate bonds due to the presence of zwitterions. To mitigate this effect, Fmoc chloride was introduced as a protecting agent for the most reactive amines, enabling greater control and selectivity. Spectrometric analysis revealed the formation of several peptides, which were characterized using advanced techniques such as CID and NL46. These compounds exhibit bioactive potential, with possible applications in biotechnology and agriculture as plant bioactivators. This study underscores the importance of developing efficient methodologies for peptide synthesis and analysis.

Acknowledgments

This work was supported by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001. The author thanks Prof. Dr. Eduardo César Meurer for guidance and the Universidade Federal do Paraná for institutional support.