

Influence of aluminum oxide on the prebiotic thermal synthesis of Gly-Glu-(Gly-Glu)_n polymer

Leyton, Patricio

Zárate, R. Antonio

Fuentes, Sandra

Paipa, Carolina

Gómez-Jeria, Juan S.

Leyton, Yessica

The effect of the aluminum oxide on the thermal synthesis of the glycine-glutamic acid (Gly-Glu-(Gly-Glu)_n polymer is described. The thermal synthesis in the molten state was carried out in the absence and presence of the oxide. In both cases, the vibrational spectra showed characteristic group frequencies corresponding predominantly to a Gly-Glu-(Gly-Glu)_n sequence in the polymeric structure. The theoretical spectral data support the experimental proposed Gly-Glu-(Gly-Glu)_n sequence for the polymer. The SEM-EDX characterization of the solid phase involved in the thermal synthesis showed that the aluminum oxide participates as a site for nucleation and growth of the polymer, explaining the increase of 25% efficiency in the presence of aluminum oxide. Electrophoresis data show shorter polypeptide chains in the presence of aluminum oxide. © 2011 Elsevier Ireland Ltd.