L–Lysine Amino Acid Adsorption on Zeolite L: a Combined Synchrotron, X-Ray and Neutron Diffraction Study

Invited for this month’s cover are the groups of Annalisa Martucci and Luisa Pasti at the University of Ferrara (Italy). The cover picture shows L-lysine amino acid adsorption on zeolite L. The role of zeolite channels in the stabilization of the lysine absorbed and the effect of water on protein structure are elucidated at atomistic level. The stabilization of the L α-helical conformation is related to strong H-bonds between the tail aminogroups of lysine molecules and the Brønsted acid site as well as to complex intermolecular H-bond system between water molecules, zeolite and amino acid. Read the full text of their Full Paper at 10.1002/open.202000183.

In one word, how would you describe your research?
Original

What is the most significant result of this study?
The stabilization of the L α-helical conformation is due to the presence of strong H-bonds between the tail aminogroups of lysine molecules and the Brønsted acid site as well as the occurrence of complex intermolecular H-bond system between water molecules, zeolite and amino acid.

Who designed the cover?
Cover designed by Annalisa Martucci

What future opportunities do you see (in the light of the results presented in this paper)?
The L zeolite can be considered a proper sorbent material to operate in amino acids fractionation. These results can be transferred to investigation of stereochemistry in related microporous materials, providing new information on the adsorption of amino acids in zeolites from aqueous phases and could be used to support industrial biotechnology by qualitatively predicting binding behavior.