

The use of Armenian Natural Zeolite for Amino Acids Removal from the Aqueous Solution

G.H. Torosyan and A.A. Isakov

Department of Chemical Technologies, National Polytechnic University, Republic of Armenia

Zeolite is used mainly as a filtering material for wastewater treatment and purification of drinking water. Zeolite is commonly used for the filtering process taking into consideration its chemical stability, high mechanical strength, more developed specific surface, porosity and also because it is a cheap and freely available material. The main objective of the study is to focus on the development and evaluation of a process for the removal of amino acid from wastewater. The study specifically discusses the adsorption of isotherms in the liquid phase of various amino acids for furfural. The study has used chromatographic methods for amino acid determination. It has been found that sorption of amino acids by natural zeolites and modified analogs are advantageous. In all likelihood less bulky molecule of alanine is adsorbed better on zeolites, which enter into the pores or form strong Van der Waals forces around the pores. The molecules of amino acids cannot penetrate in a cavity of zeolites such as 5\AA / as a cavity makes approximately $4-5\text{\AA}$ /; but they can form hydrogen bonds with amino-acid's molecule. Moreover, there exists two or more types of acidic hydrogen atoms in amino acid. This is one of the possibilities to have a harder bonding with the zeolite's surface hydroxyl groups. The method presents the perspective technology of the purification of water (treatment of wastewater). This work focuses on the development and evaluation of a process for the removal of amino acids from waste water; it precisely discusses the adsorption of isotherms in liquid phase of various amino acids for furfural. The proposed method can also be used for amino acid determination by liquid chromatographic methods with the zeolitic columns.

Keywords: Natural Zeolite, Amino Acids, Chromatographic methods