PRODUCTION OF ANIONITE BY MODIFICATION OF POLYVINYL CHLORIDE IN THE PARTICIPATION OF UREA

Babojonova G.K
Alfraganus University Senior Lecturer, PhD
e-mail: muhammadali20201009@gmail.com

In recent years, ion-exchange materials based on synthetic polymers have been used in the mining industry for the selective extraction of non-ferrous, rare, heavy and rare metals, as well as in the concentration of technological solutions, in the desalination of river waters for the use of atomic and thermal energy, as well as in chemical industries. In softening, a widely used, economically cheap and effective method of wastewater treatment is the ionization method with the presence of ions [1]. Therefore, the synthesis of new ion exchange materials based on local raw materials and the study of their important properties are urgent issues. Due to their high operational properties, ion exchange materials are widely used in almost all fields of science and industrial practice. With their help, one of the most urgent social and environmental problems is being solved: environmental protection. [2;3]. In particular, it has a high sorption property against various metals, is chemically stable, is stable to temperature changes, and is cheap. must meet the requirements [4]. The method of separation of existing ions in water with the presence of ionites meets exactly such requirements [5]. Therefore, synthesis of new ionites with high sorption properties is of great practical importance.

It is important that mechanical materials used in various branches of industry meet a number of requirements, one of the most important of which is the chemical stability of mechanical materials in relation to various aggressive environments. Usually, the water prepared for industry or the water coming out of the sonoate are solutions with a complex composition. These solutions contain strong oxidizers, acids and alkalis. For this reason, it is required that industrially used mechanical engineering materials have high chemical stability.

Taking into account the above requirements, the chemical stability of anionite modified on the basis of polyvinyl chloride and urea (PPE-2) in relation to various aggressive environments was studied. In order to determine the chemical stability of the synthesized anion exchange materials, the effect of various strongly oxidizing, acidic and alkaline environments on anionites was studied. For this, anionites were stored in strong oxidizing, strong acid and alkaline environments for 10 to 48 hours. The anionic scavenging materials were then filtered from the solutions, washed in deionized water and activated.

Table 1

Chemical stability of PPE-2, PPE-1 and AN-31 anionites under aggressive conditions

Solution ıvironment	Research ıvironment	SEC, mg-ekv/g	$\frac{COE_{ox}}{COE_{бош}}$,	Mass ıange; %

	T, K	Hour	last	initia		
PPE-2 (based on PVC and urea)						
1%HNO_3	298	48	2.07	2,34	88,4	3.10
5%HNO_3	298	48	1.85	2,34	79,0	4.45
1%HClO	298	48	1.82	2,34	77,6	7.23
5%HClO	298	48	1.62	2,34	69,1	7.42
5%NaOH	373	10	2.16	2,34	92.2	2.40
PPE-1 (based on PVC and PEPA)						
1%HNO_3	298	48	3,96	4,20	94,3	2.80
5%HNO_3	298	48	3,62	4,20	86,6	3.75
1%HClO	298	48	3,60	4,20	85,7	2.84
5%HClO	298	48	3,03	4,20	72,1	4.20
5%NaOH	373	10	3.91	4,20	93,1	2.10
AN-31 (Ammonia, Epichlorohydrin and PEI)						
1%HNO_3	298	48	1.29	2,32	51.8	1.30
5%HNO_3	298	48	1.62	2,32	78.8	-
1%HClO	298	48	0	2,32	0	17.2
5%HClO	298	48	0	2,32	0	17.4
5%NaOH	373	10	2.00	2,32	96.0	-

Later, in order to determine the stability of anion exchange materials against various aggressive environments, the SAS values of anionites were determined by hydrochloric acid, and the chemical stability of these anions was determined by comparing them with the initial SAS values. The data obtained on the chemical stability of anionites are presented in the table below. Also, in order to compare the chemical stability of anions in Table 1 below, AN-31 used on an industrial scale and chemical stability of PPE-1 anions synthesized by scientists of the Department of Polymer Chemistry of the National University of Uzbekistan were compared. n this case, PPE-1 anionite retained its static exchange capacity up to 86.6%, AN-31 anionite up to 78.8%, and PPE-2 anionite up to 79%. PPE-1 anionite retained static exchange capacity up to 93.1% in strong alkaline environment, while PPE-2 anionite retained up to 92.2%.

Based on the data presented in Table 1 above, it can be seen that the PPE-2 anion exchange material obtained on the basis of polyvinyl chloride and urea has a high chemical stability compared to the industrially used anionite AN-31, but it is relatively inferior to the PPE-1 anionite based on PVC and PEPA. we can. However, despite this, PPE-2 anionite is mainly obtained from 100% local raw materials, so it is cheap in terms of price. Taking into account the given data, it is possible to recommend the use of PPE-2 anionite obtained on the basis of polyvinyl chloride and urea on an industrial scale.

The modification processes of the above-mentioned research work are unique, and are especially significant in that they use low-cost raw materials for the processing and modification of PVC waste.

LITERATURE

[1]. Li, Zhili. Synthesis of a carbamide-based dithiocarbamate chelator for the removal of heavy metal ions from aqueous solutions. Journal of Industrial and Engineering Chemistry, 2014. 20(2), 586–590 pp.

[2]. Diniz C.V., Doyle F.M., Martins A.H. Uptake of heavy metals by chelating resins from acidic manganese chloride solution, Minerals Metallurgy Processing, 2000; Vol. 17, pp. 217-222.

[3]. A.M.K. Choi, J. Alam, American Journal of Respiratory Cell and Molecular Biology 15 (1996) 9.

[4]. M. Suwalsky, R. Castro, F. Villena, C.P. Sotomayor, Cr(III) exerts stronger structural effects than Cr(VI) on the human erythrocyte membrane and molecular models .Journal of Inorganic Biochemistry 102 (2008) 842.

[5]. Arezoo Azimi, Ahmad Azari, Mashallah Rezakazemi, Meisam Ansarpour. Removal of Heavy Metals from Industrial Wastewaters:A Review February 2017 ChemBioEng Reviews 4(1):37-59.