

Hydrothermal crystallization in the natural mineral of Nakhchivan – LiOH + LiCl system

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Hydrothermal synthesis was carried out in the natural mineral of Nakhchivan – LiOH + LiCl system. Hydrothermal synthesis was carried out in Mory type autoclaves with a volume of 18 cm³, autoclave filling factor F = 0.8. The hydrothermal crystallization experiments were carried out without creating a temperature gradient and without mixing the reaction mass. The ratio of solid to liquid is 1:10. A natural sample was taken from a zeolite-containing horizon in the northwest of the Kyukyuchay River, where its content varies between 75–80%. The samples were Nakhchivan zeolite tuffs, 78.5% of which is the main mineral - mordenite (Ca₂Na₂K_{2.8}Al_{8.8}Si_{39.2}O₉₆ · 34H₂O), 19.5% quartz (SiO₂) and 2.00% anorthite (Ca_{0.86}Na_{0.14}Al_{1.94}Si_{2.06}O_{8.01}). The sample was thoroughly washed with distilled water and dried at 100°C for 3 days. The zeolite phase was identified by X-ray diffraction (2D PHASER «Bruker» (CuK_α radiation, 2θ=20–80°)) and elemental (Launch of Triton XL ditution refrigerator – Oxford instrument) analysis methods. Hydrothermal crystallization was studied under the following conditions: temperature - 100-300°C, LiOH concentration – 5-30%, LiCl concentration – 5-15%, processing time – 1-100 hours. X-ray diffraction patterns of crystallization products are shown in Fig.

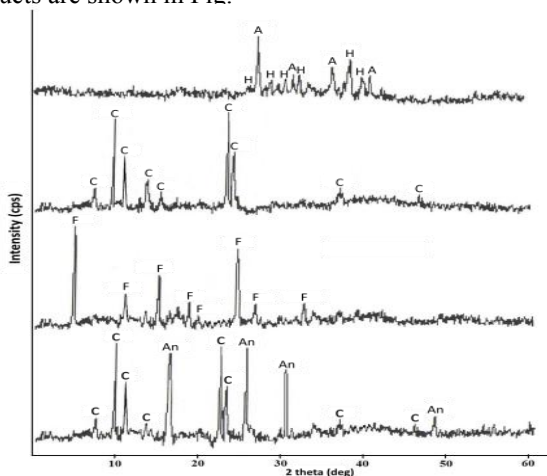


Fig. X-ray diffraction patterns of crystallization products in the natural Nakhchivan zeolite – LiOH + LiCl system (An-analcime, C-clinoptilolite, F-faujasite, H-hydrosodalite, A-albite)