

# HYDROTHERMAL CRYSTALLIZATION IN THE NATURAL MINERAL OF NAKHCIVAN – LiOH SYSTEM

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Hydrothermal synthesis was carried out in the natural mineral of Nakhchivan – LiOH system. Hydrothermal synthesis was carried out in Mory type autoclaves with a volume of 18 cm<sup>3</sup>, 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 (Ca<sub>2</sub>Na<sub>2</sub>K<sub>2.8</sub>Al<sub>8.8</sub>Si<sub>39.2</sub>O<sub>96</sub>·34H<sub>2</sub>O), 19.5 % quartz (SiO<sub>2</sub>) and 2.00 % anorthite (Ca<sub>0.86</sub>Na<sub>0.14</sub>Al<sub>1.94</sub>Si<sub>2.06</sub>O<sub>8.01</sub>). 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 $\alpha$  radiation, 2 $\theta$ =20–80°)) and elemental (Launch of Triton XL ditution refrigerator – Oxford instrument) analysis methods.

Hydrothermal crystallization was studied under the following conditions: temperature – 100–250 °C, LiOH concentration – 10–25 %, processing time – 1–100 hours. The results of hydrothermal crystallization under various conditions are presented in the table.

Table. Transformation of the Nakhchivan natural mineral during hydrothermal treatment in a LiOH solution

Obtained phases	The concentration of LiOH, %	t, °C	Processing time, h
Mordenite	10	100	10
Chabazite	10 – 20	100	50
Clinoptilolite + chabazite	10 – 20	100 – 250	50 – 100
Hydrosodalite + albite	25	250	100