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The new single crystals with alpha-quartz structure obtained by hydrothermal method MICLAU MARINELA, BUCUR RAUL, POIENAR MARIA, VLAZAN PAULINA, GROZESCU IOAN, Condensed Matter Research Department, National Institute R&D Electrochemistry and Condensed Matter, Plautius Andronescu 1, Timisoara, Romania, MUSCUTARIU IOAN, Baldwin-Wallace College, Berea, Ohio 44017-2088, U.S.A, MICLAU NICOLAE, "Politehnica" University of Timisoara, Bd. Vasile Parvan, nr.2, Romania, INCEMC TEAM, BALDWIN-WALLACE COLLEGE TEAM, POLITEHNICA UNIVERSITY TEAM — Interest of Si1-xGexO2 single crystal with alpha-quartz structure is connected to improvement of electromechanical coefficients and rise of alpha – beta phase transition of quartz one. Growth of alpha - Si1-xGexO2 single crystal was realized by a hydrothermal method of temperature gradient in autoclaves, made from Cr–Ni alloys. Nutrient material was prepared from synthetic quartz and placed in the bottom of autoclaves. There was loaded GeO2 powder additive in proportions to quartz nutrient. Single crystals were investigated by electron microprobe analysis, X-ray diffraction and atomic force microscopy. The most important result, which was obtained during the investigations, is an experimental proof of growth of Si1-xGexO2 solid solutions single crystals (with quartz structure) under the hydrothermal conditions. The present results thus open the possibility to tune the piezoelectric properties of these materials by varying the chemical composition.

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