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A Nanoporous Anodic Aluminum Oxide as Basis on Creation of High-Performance Microsensors (Mechanical, Physical, Chemical, Bio-, MEMS and Actuators)

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Anodic alumina oxide (AAO) technology enables to modify material properties depending on the needs of concrete conditions of exploitation. It gives the possibility of quick creation of the necessary device prototype and customization of its characteristics. On the basis of an AAO template a prototype of the various sensors has been created and developed, including physical, gas, chemical and biological sensing, as well as multi-sensor systems with local nanodimensional elements. It is also proposed to create multiple constructions of high-efficient microsensors, such as humidity, vibration, acceleration, position, micro gyroscopic, static electricity, micro electromechanical optical switches, optical micro scanner, optical-electrostatic micro relay, electro-current micro relay, microchips for ecology monitoring of environment, and micro lab-on-chip. In comparison with other technologies and based on self-organization, aluminum oxide is the perspective for the formation of nanocapillary system matrices in relation to the demands of high quality magnetic, magneto resistive and magneto-optical materials and sensors based on them.

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Ключевые слова:

Содержание

Abstract

Introduction

Universal template for construction of gas microsensors (hydrogen, ozone)

Physical sensors (humidity, pressure, temperature, position microgyroscope)

Mechanical sensors (force, acceleration, vibration, knock)

Micro-electromechanical systems (MEMS)

Micro-opto-electromechanical systems (MOESMS)

Actuators

Conclusions