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A deep understanding of the principles of carbon nanotubes formation as well as the creation of models of synthesis of CNTs, that determine their functional properties. Formation of clusters in the volume of the reactor and on the surface of the substrate is the initial stage of the synthesis of carbon nanotubes. We developed the thermodynamic of homogeneous and heterogeneous cluster's formation for CVD process with "flying" catalysts. Studied experimentally and theoretically the parameters of cluster formation, resulting from the pyrolysis of ferrocene. It is shown that the surface tension and the size of the clusters depend strongly on the temperature. The coefficients of surface tension, as well as the characteristic size of clusters have been calculated. These dependencies and parameters enable to recover the distribution function of cluster size, setting the temperature in the working zone and in the field of sublimation of ferrocene. This making possible to predict the size of the clusters, depending on the synthesis parameters, including temperature. Keywords: cluster formation, catalyst, CNT
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Shtennikov V. N. <i>Technique of Maintenance of the Demanded Temperature of the Contact Soldering</i> 30 Quality of soldering connections first of all depends on soldering temperature. Standard modes of installation do not guarantee reception qualitative soldered connections of a unique design. The author of article develops

and approves a technique of maintenance of the demanded temperature of the contact soldering for connections not a typical design.

Keywords: the device, assemblage, microelectronics, the soldering, quality

The different approaches for calculation of the capacity of plane capacitor, composed of two identical square or round electrodes, versus interelectrode gap and relative electrodes displacement are compared. The deviations arising from capacitance calculations using different approaches are calculated. The analytical expression for capacitance estimation in case of the overlapping electrodes is presented.

Keywords: MEMS, electric capacitance, plane capacitor, fringing field effect, analytical expressions

The paper presents the error model, describing influence of linear acceleration on the indications of MEMS-based gyro, and the algorithm, which allows to correct this influence. The system under test was inertial measurement unit based on micromechanical sensors produced by Analog Devices. The research has been performed by using a small-sized two-axis rotary test table developed by department of Laser Measurement and Navigation Systems of Saint-Petersburg Electrotechnical University.

Keywords: inertial navigation, error model, micromechanical gyro, small-sized two-axis test table

The advanced precise equipment for electronic and engineering technology is usage multicoordinate mechatronic actuators for the ultra-precise positioning. The analysis, design and parameters of the new magnetic rheology (MR), electric rheology (ER) and magnetorheological elastomer actuators are presented. The combination of MR or ER loop control, elastic carriers and thin wall seals ensures small error of linear (≤ 100 nm) and angular (≤ 0.2 ang. sec) positioning, small time of response (≤ 200 ms), total linear travel on three coordinates X, Y, Z (1...10) mm and load capacity (1...1000) N.

Keywords: positioning and vibration isolation systems, magneto- and electrorheological fluids and elastomers, viscosity

Edge field emission cathode made of thermal expanded graphite is considered as electron source for cathodoluminescent device. Changing the principle of the electron-optical system formation provided for considerable cathode operating area per cathode substrate area increase.

Electron-optical system and electron trajectories modeling for round cathode is held.

Keywords: field emission, cathodoluminescent light sources, electron optics, carbon materials

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