

On-Demand Remote Control of Nanomotor Movement

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BACKGROUND

The use of synthetic nanomotors to power nanomachines and nanofactories is an important challenge in nanotechnology. Designing and building new and powerful nanoscale motors and propulsion modes is the first aspect of the challenge. Second is the need to steer nanomachines along a given direction and towards a specified destination. Precise motion control is essential to meeting the demands of future nanomotor applications, e.g., nanoscale drug delivery, assembly, and patterning. Nanomotor navigation is particularly challenging because of the combined conditions of Brownian motion and low Reynolds numbers.

TECHNOLOGY DESCRIPTION

UC San Diego researchers have developed methods for controlling the motion of artificial nanomotors. The invention pertains to on-demand remote control of the motion of catalytic, fuel-driven nanomotors in connection with external stimuli. For example, placing a microelectrode near the nanomotors and applying an electrochemical or thermal pulse turns the nanomotor on or off repeatedly. Further, on-demand control of nanomotor speed is achieved by controlling the temperature or potential during the thermal or electrochemical pulse, respectively. A network of microelectrodes can be used to control the speed and direction of the nanomotors along their path. In another example, the motion of bimetal nanowire motors (e.g., Au-Pt) is controlled by the presence of specific ions (e.g., trace Ag(I)) through a chemical-sensing mechanism. The invention is broad and can be applied to different types of nanomotors and different motion patterns.

INTELLECTUAL PROPERTY INFO

This technology has a patent pending and is available for sponsorship and/or licensing.

RELATED MATERIALS

- Tiny Pushes from a Distance
- Nanomotors Detect Trace Silver

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,868,991	01/16/2018	2010-003

RELATED TECHNOLOGIES

- Nanomotor Based Fabrication and Patterning of Defined Nanostructures

CONTACT

University of California, San Diego
Office of Innovation and Commercialization
innovation@ucsd.edu
tel: 858.534.5815.



OTHER INFORMATION

KEYWORDS

nanomotor, nanomachine, catalytic

nanomotor, nanomotor control,

nanomotor navigation

CATEGORIZED AS

- Nanotechnology
 - Electronics
 - Materials
 - NanoBio

RELATED CASES

2010-003-0, 2010-207-1