

Science of Advanced Materials

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A Special Issue on

“Nano-Engineered Silicon: Technology and Applications”

CALL FOR PAPERS

Silicon has been, and continues to be, the material support of the integrated circuit (IC) technology—the enabling tool of the most impressive technological, industrial and social revolution of the mankind.

Although poly-crystalline silicon has played a major role in a key step of IC production (the silicon-gate technology), silicon in microelectronics is usually thought in the form of mono-crystalline slices with (1 0 0)-oriented faces and diameter in the interval 15–30 cm—the wafers. Mono-crystalline silicon has grown with the IC technology not only in diameter (from the original 1 in. to the current 11.8 in.) but also for its ability to match the numerous and complex needs of ICs. Thus, epitaxial wafers as well as silicon on insulator (SOI) and silicon on nothing (SON) are on the shelf or can be produced by standard processing.

In latest years, however, the IC technology is experiencing problems of maturity, which are expected to be soluble only by huge investment in fabrication plants. This state of affairs has motivated the search for potentially cheaper alternatives to the basic IC element—the metal-oxide-semiconductor (MOS) field-effect transistor (FET). Solutions involving the use of low dimensional structures (like silicon nanowires for the crossbar structure, or silicon quantum dots for single-electron transistors) instead of conventional MOS-FETs have been proposed. Remarkably enough, such nano-engineered silicon has been proved to be of interest not only in electronics, but also in energetics and biomedicine.

This special issue is devoted to the emerging technologies and applications of silicon at low dimensionality. Contributions, as original research papers or comprehensive review papers, are especially solicited in the following fields:

- Preparation and characterization of silicon quantum dots, nanowires and nanosheets.
- Nonlithographic or sublithographic tools for nanoengineering silicon
- Applications of silicon quantum dots in electronics and energetics.
- Applications of silicon nanowires in electronics, energetics and biomedicine.
- Silicon-based top-down and bottom-up solution to demultiplexing of nanostructures.
- Silicon-organic and silicon-bio interfaces.
- Lab-on-chip

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All papers submitted to this issue will be subject to a strict peer review process to ensure high quality articles. Please make sure in the cover letter that the submitted paper has not been published previously and is not currently submitted for review to any other journal and will not be submitted elsewhere before a decision is made by this journal.

Please notify well in advance for your intension to submit a research paper.

KEY TIMETABLE DATES

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