Process for Producing Organic Ultra Thin Films (Yissum)

code: 6-2006-71

Shlomo Yitzchaik, HUJI, Faculty of Science, The Institute of Chemistry
Vladimir Burtman, HUJI, Faculty of Science, The Institute of Chemistry

Self-assembling molecular layers for microelectronic components

Categories	Organic semiconductors, Nanotechnology, Microelectronics
Development Stage	Lab. Demo: OLED, OFET, and Biosensing
Patent Status	U.S. patents 6,316,098, 6,783,849, 6,808,803
Market Size	The flat panel display industry is forecast to reach $100 billion by 2009

Highlights

- This unique film process is a breakthrough technology, enabling organic layers of molecular thickness to be laid directly on a silicon die without loss of performance and with stable electronic properties for the mass production of inexpensive, advanced semiconductors
- Provides a solution for the problems of power consumption, heat generation, and microstructures' switch leakage in smaller and higher-quality transistor structures for faster, more sensitive and more efficient microprocessors for mainframe and personal computers, PDA and cellular devices, and flat-panel displays.
- For next-generation, high-end microprocessors, the processes are compatible with both silicon technology and organic electronics.

Our Innovation

- Our organic ultra thin-film technology, molecular layer epitaxy (MLE), is a self-assembling molecular layering process that enables component performance and manufacturability.

Key Features

- Semi-conducting films 100,000 times thinner than current standards
- High electron mobility higher than other organic films - significantly enhancing existing products, while enabling novel high-performance devices
- Can reduce operational costs by up to 90%
- Greater than 98% yield
- Allows for creation of flexible devices
- Enables production of billions of nano-structures in a single process

Development Milestones

- Proof of concept for organic-electronic based biosensor, requiring 2 years and $2 million

The Opportunity

- Worldwide revenues for semiconductors rose by 10% in 2006, to $262.7 billion

Contact for more information:
Dov Reichman ✉, VP Business Development - Chemistry & Physics, +972-2-6586692

Yissum Research Development Company of the Hebrew University of Jerusalem
Hi-Tech Park, Edmond J. Safra Campus, Givat-Ram, Jerusalem P.O. Box 39135, Jerusalem 91390
Israel Telephone: 972-2-658-6688, Fax: 972-2-658-6689