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**Nanotechnology Polymer Optical Modulator Market
Opportunities, Strategies, and Forecasts, 2005 to 2011**

Nanotechnology Polymer Optical Modulator



Picture by Susie Eustis

MOUNTAINS OF OPPORTUNITY

**WinterGreen Research, Inc.
Lexington, Massachusetts**

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21 TABLES AND FIGURES

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CHECK OUT THESE KEY TOPICS

OPTICAL MODULATOR MARKET FORECASTS
NANOTECHNOLOGY MATERIALS FOR MODULATORS
Voice In Broadband Next Generation Network (NGN)
Optical Modulators Support High-Speed Network

Optical Market Overview
Key Elements Of Optical Component Business Strategy
GROWTH OF TELECOM MARKETS
CORE WIRELESS VOICE NETWORKS
POLYMER TECHNOLOGY
LITHIUM NIOBATE
CHANGING INTERNET TRAFFIC
INDIUM PHOSPHIDE
PHOTONIC INTEGRATED CIRCUIT (PIC) MARKET FORECASTS
GALLIUM ARSENIDE
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Nanotechnology Polymer Optical Modulator Market Opportunities, Market Forecasts, and Market Strategies, 2005-2011

Many of the arguments surrounding the materials for modulators and methods of integration with lasers are relevant to many of the functions needed for optical networks, not just modulators. The monolithic versus hybrid debate and the quest to reduce package size may seem to favor compound semiconductors. The key issue is not that scientists are working at this scale, it is that they are performing manipulations at the atomic level to create novel materials structures.

Polymer technology is emerging as a significant technology. But, in the context of polymers, there are vast differences. A polymer is not a polymer; a polymer at the nanotechnology level is a collection of carbon and other molecules connected in a particular manner. The ability to make sophisticated polymers with the desired characteristics is basic to the chemistry applied to the optical modulator technology problem.

Any chemist can make a basic polymer. The ability to make a polymer that works for telecommunications in a network as an optical modulator is a far more difficult task. Not every chemist can make the polymer desired. There is a range of options in constructing the polymer and only the nanotechnology experts can generate a polymer with the desired characteristics. There are vast differences in quality even in the select group able to make polymer optical modulators.

The situation is similar to making bread. Everyone can mix flour and yeast. The mixing is easy, you get the ingredients and put them together, but some bread is better than other bread, some is really good, and some is not even eatable. A blob of dough the right length cooked at the right temperature produces bread that rises at the end of cooking instead of producing a limp lump of flour blob. Polymer chemistry is the same.

A polymer is just a collection of carbon molecules and some dyes. The same idea of a correct mixture at a correct temperature goes for polymers. It is the recipe and the temperature and the choice of other molecules that are combined with the carbon that makes a functional optical modulator. How carbon is attached and how other molecules are attached to the carbon determine what happens inside the optical modulator.

The important thing is the side groups or the functionality created by the chemistry of the polymer. Not all polymers are the same. Chemically different functionality groups are created to make the optical modulator. How those functionality groups are distributed along the carbon determines what is attached where.

A polymer is just a length of carbon molecules connected together, instead of being a chain they are one unit. The definition of the polymer is further controlled with dyes. These dyes are added in different concentrations and at different temperatures to make proprietary substances that are more or less useful.

Companies Profiled

Market Leaders

JDS Uniphase
Bookham Technologies
Finisar

Market Participants

Avanex
Lumera
Sumitomo

New Focus
Pacific Wave

Nanotechnology Polymer Optical Modulator Strategies and Forecasts, 2005-2011

REPORT METHODOLOGY

THIS IS THE 265TH REPORT IN A SERIES OF MARKET RESEARCH REPORTS THAT PROVIDE FORECASTS IN COMMUNICATIONS, TELECOMMUNICATIONS, THE INTERNET, COMPUTER, SOFTWARE, TELEPHONE EQUIPMENT, HEALTH EQUIPMENT, AND ENERGY. THE PROJECT LEADERS TAKE DIRECT RESPONSIBILITY FOR WRITING AND PREPARING EACH REPORT. THEY HAVE SIGNIFICANT EXPERIENCE PREPARING INDUSTRY STUDIES. FORECASTS ARE BASED ON PRIMARY RESEARCH AND PROPRIETARY DATA BASES. FORECASTS REFLECT ANALYSIS OF THE MARKET TRENDS IN THE SEGMENT AND RELATED SEGMENTS. UNIT AND DOLLAR SHIPMENTS ARE ANALYZED THROUGH CONSIDERATION OF DOLLAR VOLUME OF EACH MARKET PARTICIPATION IN THE SEGMENT. INSTALLED BASE ANALYSIS AND UNIT ANALYSIS IS BASED ON INTERVIEWS AND AN INFORMATION SEARCH. MARKET SHARE ANALYSIS INCLUDES CONVERSATIONS WITH KEY CUSTOMERS OF PRODUCTS, INDUSTRY SEGMENT LEADERS, MARKETING DIRECTORS, DISTRIBUTORS, LEADING MARKET PARTICIPANTS, OPINION LEADERS, AND COMPANIES SEEKING TO DEVELOP MEASURABLE MARKET SHARE. OVER 200 IN DEPTH INTERVIEWS ARE CONDUCTED FOR EACH REPORT WITH A BROAD RANGE OF KEY PARTICIPANTS AND INDUSTRY LEADERS IN THE MARKET SEGMENT. WE ESTABLISH ACCURATE MARKET FORECASTS BASED ON ECONOMIC AND MARKET CONDITIONS AS A BASE. USE INPUT/OUTPUT RATIOS, FLOW CHARTS, AND OTHER ECONOMIC METHODS TO QUANTIFY DATA. USE IN-HOUSE ANALYSTS WHO MEET STRINGENT QUALITY STANDARDS. INTERVIEWING KEY INDUSTRY PARTICIPANTS, EXPERTS AND END-USERS. OUR RESEARCH INCLUDES ACCESS TO LARGE PROPRIETARY DATABASES. LITERATURE SEARCH INCLUDES ANALYSIS OF TRADE PUBLICATIONS, GOVERNMENT REPORTS, AND CORPORATE LITERATURE.

YOU MUST HAVE THIS STUDY

Nanotechnology Polymer Optical Modulator Market Opportunities, Strategies, and Forecasts, 2005 to 2011

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ABOUT THE COMPANY

WINTERGREEN RESEARCH, HAS A UNIQUE RESEARCH STRATEGY THAT RELATES TO IDENTIFYING MARKET TRENDS THROUGH READING AND INTERVIEWING OPINION LEADERS. BY READING THE ELECTRONIC EQUIVALENT OF 40 FEET OF PAPER, WINTERGREEN RESEARCH SENIOR ANALYSTS CAN LEARN A LOT MORE ABOUT MARKETS, A LOT FASTER THAN CAN BE LEARNED THROUGH EXPENSIVE SURVEYS AND FOCUS GROUPS. THINKING ABOUT MARKET TRENDS IS A HIGH PRIORITY AT WINTERGREEN RESEARCH. AS WITH ALL RESEARCH, THE VALUE PROPOSITION FOR COMPETITIVE ANALYSIS COMES FROM INTELLECTUAL INPUT.

IT IS A LUXURY REALLY, AVAILABLE TO ONLY A VERY FEW PEOPLE, TO BE ABLE TO GATHER INFORMATION, LOTS OF INFORMATION FROM READING MASSIVE AMOUNTS OF CONTENT, AND THEN TRYING TO MAKE SENSE OF THAT CONTENT. THE ABILITY TO THINK ABOUT MARKET TRENDS IS ENHANCED BY DOING IT OVER AND OVER FOR MANY DIFFERENT MARKETS. THAT IS WHAT WINTERGREEN RESEARCH IS ALL ABOUT: READING AND THINKING IS AN ESSENTIAL ASPECT OF COMPETITIVE ANALYSIS. TALKING TO OPINION LEADERS IS THE THIRD ESSENTIAL ASPECT OF PRODUCING GOOD, RELIABLE DATA.

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ABOUT THE PRINCIPAL AUTHORS

ELLEN T. CURTISS, TECHNICAL DIRECTOR, CO-FOUNDER OF WINTERGREEN RESEARCH, CONDUCTS STRATEGIC AND MARKET ASSESSMENTS IN TECHNOLOGY-BASED INDUSTRIES. PREVIOUSLY SHE WAS A MEMBER OF THE STAFF OF ARTHUR D. LITTLE, INC., FOR 23 YEARS, MOST RECENTLY AS VICE PRESIDENT OF ARTHUR D. LITTLE DECISION RESOURCES, SPECIALIZING IN STRATEGIC PLANNING AND MARKET DEVELOPMENT SERVICES. SHE IS A GRADUATE OF BOSTON UNIVERSITY AND THE PROGRAM FOR MANAGEMENT DEVELOPMENT AT HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. SHE IS THE AUTHOR OF RECENT STUDIES ON WORLDWIDE TELECOMMUNICATIONS MARKETS, THE TOP TEN INTERNET EQUIPMENT COMPANIES, THE TOP TEN CONTRACT MANUFACTURING COMPANIES, AND THE TOP TEN TELECOMMUNICATIONS MARKET ANALYSIS AND FORECASTS.

SUSAN EUSTIS, PRESIDENT, CO-FOUNDER OF WINTERGREEN RESEARCH, HAS DONE RESEARCH IN COMMUNICATIONS AND COMPUTER MARKETS AND APPLICATIONS. SHE HOLDS SEVERAL PATENTS IN MICROCOMPUTING AND PARALLEL PROCESSING. SHE HAS THE ORIGINAL PATENTS IN ELECTRONIC VOTING MACHINES. SHE HAS NEW PATENT APPLICATIONS IN FORMAT VARYING, MULTIPROCESSING, AND ELECTRONIC VOTING. SHE IS THE AUTHOR OF RECENT STUDIES OF THE REGIONAL BELL OPERATING COMPANIES' MARKETING STRATEGIES, INTERNET EQUIPMENT, BIOMETRICS, A STUDY OF INTERNET EQUIPMENT, WORLDWIDE TELECOMMUNICATIONS EQUIPMENT, TOP TEN TELECOMMUNICATIONS, DIGITAL LOOP CARRIER, WEB HOSTING, WEB SERVICES, AND APPLICATION INTEGRATION MARKETS. MS. EUSTIS IS A GRADUATE OF BARNARD COLLEGE.

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