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Creative Indian Scientist Presents Breakthrough Research in Nanotechnology



Dr. Gordhan Patel explaining Nanotechnology
Photo: Dhiren Shah

By Staff Reporter

If a nano is so small, can you see a nanosized object with your naked eyes? Most of us would confidently say "no". How can one see an object which is 50,000 times thinner than a hair? That is the difference between us and Dr. Gordhan Patel, an eminent research scientist. He thinks and sees things many of us don't. He sees an empty glass full and a layer of aluminum of a metallized plastic film (like that on bag of potato chips, helium balloons and thin shiny wrapping film) as a two dimensional giant nano-structure.

Dr. Patel has been doing research and development since 1966. He's worked with very prominent professors and scientists in India, England and the USA. He has more than 50 patents, 60 research publications and given 60 lectures by invitation in many countries. He has his own highly equipped multi-million dollar research and development facility, JP Laboratories, Inc, in NJ since 1983. He is unusually quiet and dedicates all of his time two things, his family (children and grandchildren) and his research work.

Most of scientists working on nanotechnology work on making, understanding and developing products from nanostructures. Dr. Patel saw a large number of products that can be developed by destroying nanostructures; "creativity in destruction"; . By doing so, he pioneered a novel and unique field of nano-science, he calls nano-convertology or nano-destructology for a lack of better terminology and developed a large number of products including about 20 different classes of indicators which have the most desired properties. Dr. Patel says "even where some intelligent people fail to imagine, research scientists see such things":

Not only has he opened up an entirely new field of nano-science but by destroying a two dimensional nano thick layer of aluminum (metallized plastic film), he developed a number of new products including self-

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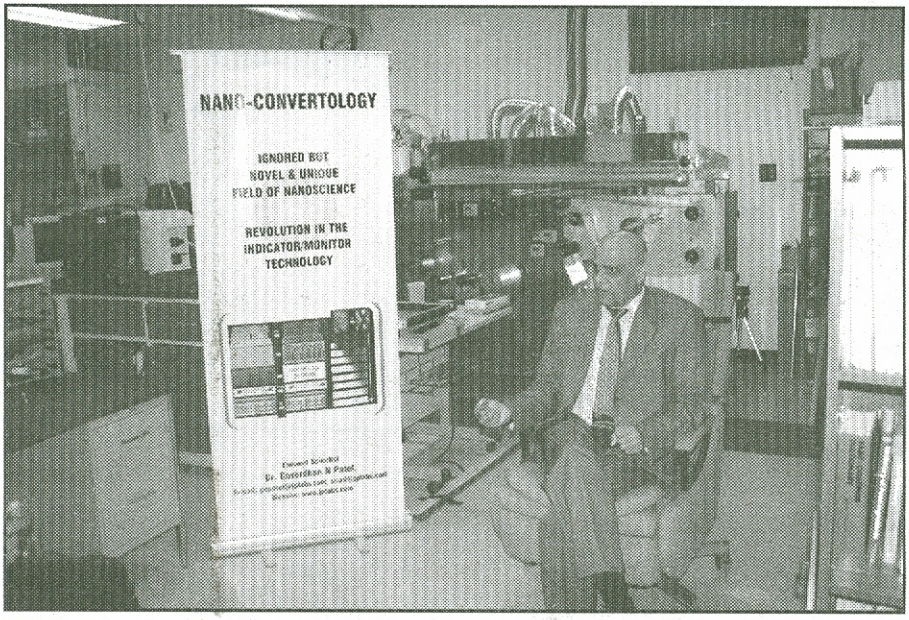
reading (in any language and color) indicators for monitoring quality of food, sterilization indicators for hospitals, electronic circuits/RFID, self-canceling high security ID badges and indicators for CBRN (Chemical, Biological, Radiological and Nuclear) for combating terrorism.

For the first time he has demonstrated that a nano thin aluminum layer can be destroyed with steam and can be used for monitoring sterilization of medical products with steam. These products are idiot-proof, one can read the messages and if one does not know how to read, a person can see the color to tell that the food is fresh or not and note if medical supplies are sterilized or not.

You may be wondering how all of this works? A message, "FRESH" is printed over the metal layer and another, "NOT" is printed in the back of metallized plastic (red colored) film. As the metal layer is opaque one reads "FRESH" and can't read "NOT". An activator tape containing an edible acid such as phosphoric acid (which is in Coke/Pepsi) in the adhesive of the tape is applied on the metal layer. Phosphoric acid reacts/dissolves the nano thin (~10 nanometer) aluminum layer and destroys it, thereby making the film transparent. The parameters of the system are so adjusted that only when the food goes bad, the word "NOT" appears from the back and one reads "NOT FRESH". All other indicator products are also based on similar principles. Though the science behind these products is very complex, the utility is simple. These indicators based on destruction of nanostructures will bring a revolution in monitoring and other technologies.

Before Dr. Patel made the major announcement on this novel nano-conversion technology, a scientist of the Indian Government noted a summary page on his website (www.jplabs.com) a month ago. He described the technology to a deputy minister (Lt. General Dr. Bhardwaj) of National Disaster Management Authority (NDMA), equivalent to our FEMA (Federal Emergency Management Agency). A few departments/agencies (NDMA, MoEF, and PNGRB) of Indian Government and FICCI (Federation of Indian Chambers of Commerce and Industries) jointly invited him to unveil the nano-conversion technology at an international conference on disaster management in Mumbai on February 15, 2010. A director of FICCI immediately recognized the size of the market, a couple of billion dollars for these new products and agreed to introduce the technology to major Indian industrialists.

Dr. Patel was then invited by minister General Vij (former Chief of Indian Army and Vice Chairman of NDMA. Dr. Manmohan Singh, PM is the Chairman) to Delhi on February 22 to make a presentation of his radiation dosimeter and nano-conversion technology for combat-



Dr. Gordhan Patel in his laboratory *Photo: Dhiren Shah*

ing terrorism. A minister, several deputy ministers and top scientists attended his lecture in Delhi.

He was then invited by Chief Minster, Narendra Modi's office where he made one hour presentation on his technology in Gandhinagar, Gujarat. He met many Indian industrialists for manufacturing and marketing the nano-conversion technology.

During his presentations, Dr. Patel stated that he has just cracked opened the doors of a new field in nano-science and has only begun to scratch the surface. Till date he has explored and developed products based on only a two dimensional nano-structure, a nano-thick layer of aluminum. There remains a large number of other activators/chemicals, alloys, metals and processes which have still to be explored and alongside this a variety of products which can be made to consumers and businesses. He says there are three, one and so-called zero-dimensional (quantum dots) nanostructures, biological materials and processes which need to be explored. Funding for R&D on nanotechnology by the US Government for 2010 is 1.6 billion dollars. He hopes that governments around the world will provide the much needed funding and that the scientific community will explore the vastness of the field of nano-destructology to help develop countless other products for betterment of mankind.

Most research scientists develop but a few new products in their lifetime. Dr. Patel has developed a new field of nano-science (nano-convertology), a large number of unique and novel products with market potentials worth billions of dollars. Let us see where this new field of nano-science leads us to.