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## Zinc oxide eco-green nano-materials for photovoltaic applications

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The global energy challenge is currently to develop an environmentally friendly, low cost and sustainable energy harvesting solution to meet the energy needs.

The ability to develop high efficiency and eco-green Nanostructure based solar cells is considered as a key strategy to meeting the World's energy need. The promising solar cells are expected to be based on the employment and combination of different nanomaterials and nanostructures.

Zinc oxide (ZnO), abundant natural materials, nanostructures are expected to improve the efficiency of the developed solar cells. One dimensional nanostructures offer unique advantages of high optical absorption across a broad spectrum, direct path for charge transport and high charge collection efficiency.

This research is commonly very important as it is addressing role of ecogreen nanomaterials and nanostructures in designing and developing nanowire based quantum dots sensitized solar cells.

### Biography

Basma El Zein received her Ph.D. degree in Micro and Nanotechnology from the University of Lille 1 science and technology in 2012 and her Master's degree in Engineering (electrical & Electronics) from the Lebanese University in 1999. She is an Assistant Professor at Dar Al Hekma College, Jeddah Saudi Arabia and visiting scholar at King Abdullah University for Science and Technology (KAUST). Her current research is nanostructures and nano-materials for photovoltaic applications. She is a senior IEEE member and reviewer in many international journals.

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## Graphene synthesis and applications

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Graphene has emerged as an extremely promising material due to its extraordinary properties. Graphene has unique electronic, optical, thermal and mechanical properties that make it ideal to be used in future electronic, optoelectronic, solar cell, battery and lighting devices to mention a few. However, excellent properties do not guarantee industrial success and other requirements also have to be fulfilled in order to accomplish a successful market uptake.

The different graphene synthesis methods that are currently available to produce graphene in different forms (films and platelets) will be covered. In addition, a few application examples that we are working on will be presented such as the use of graphene films in light harvesting, flexible batteries, organic light emitting diodes (OLEDs) and optical transistors. Finally, some indicators of the bright future of this material will be revealed.

### Biography

Amaia Zurutuza obtained her Ph.D. degree in polymer chemistry from the University of Strathclyde (Glasgow, UK). After completing her Ph.D. studies she worked as a Postdoctoral Research Fellow in two European projects. In 2004 she joined Ferring Pharmaceuticals where she was a Senior Polymer Scientist working in new controlled drug delivery systems. In 2010 she became the Scientific Director of Graphenea. At Graphenea she leads the research and development activities on graphene-based materials. Her research interests include the synthesis, characterization and potential industrial applications of graphene.

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