Nanotechnology for Energy Technology Application

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The current Energy Technology (ET) has been evolving in most rapid fashion to meet the world's ever growing demands and needs. But these developments of ET need to be accompanied by the advance of Nano Technology (NT). We have been focusing on ET combined with NT research and it consists of major two topics of optical components and electric devices.

The first topic is about optical components study. We have produced GaN and ZnO by using Nano structure, Light Emitting Diode (LED), FED and Solar cell structure. To fulfill the demands of higher lighting source industry, we tried to increase injection current. But we found that the outcome fall short of our expectations due to *Droop effect*. At present, we consider that we may be able to develop highly effective LED without Droop effect by using Nano rod Multi Quantum Well. In addition, we found out that light emitting can be driven without the existing complicated LED growth and processing by simply folding two boards together. Solar cell with simple structure can be also easily produced and we also expect that it will realize energy harvest for multi-purpose by producing wind energy at nights. For the last few years, multi-functional solar cell has been tried onto clothes, in which a piece of metal functioning as a solar cell is attached on clothes to harness the solar energy. In terms of practicality, it has little practical value. Thus, we made a try to make solar cell clothes. We expect that we are able to make clothes which function as solar cells by turning fiber itself into p-n inosculation.

The above studies are the examples of ET application devices combined with NT, and we will explain each one's motion mechanism and its applicability as well.