Phosphor material based on rare earth doped metal oxide and it's effect on the efficiency of solar cell

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Recently, wideband gap semiconductor oxides such as (ZnO, TiO_2, SnO_2 and ZrO_2) have received considerable research attention due to their rich functionalities and a wide variety of technological applications. Metal oxide has attracted interest for light emitting devices because of their strong and broad absorption band in the near ultraviolet region. It also has a broad emission spectrum due to the different kind of inherent defects. The intensities of the blue, green and orange emission can be influenced by the concentration of different kind of defects, thereby making it possible for the emission color to be tuned. Oxide materials have potential applications in devices such as light emitting diodes, spintronic devices, transparent conductive electrodes, lasers and solar cells.

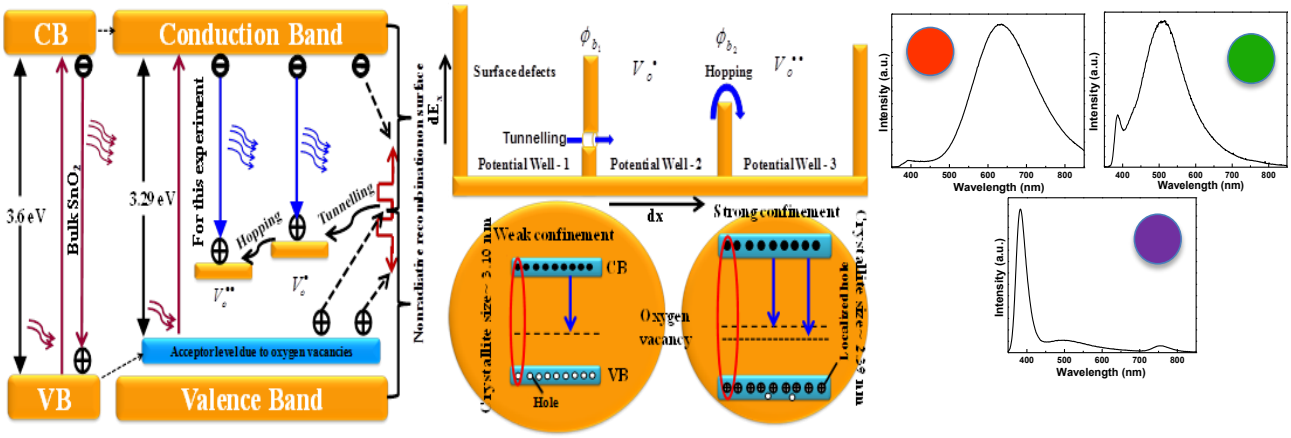

Figure 1: Band gap diagram of metal oxide quantum dots with defect levels and quantum mechanism explanation of emission with different color emission.

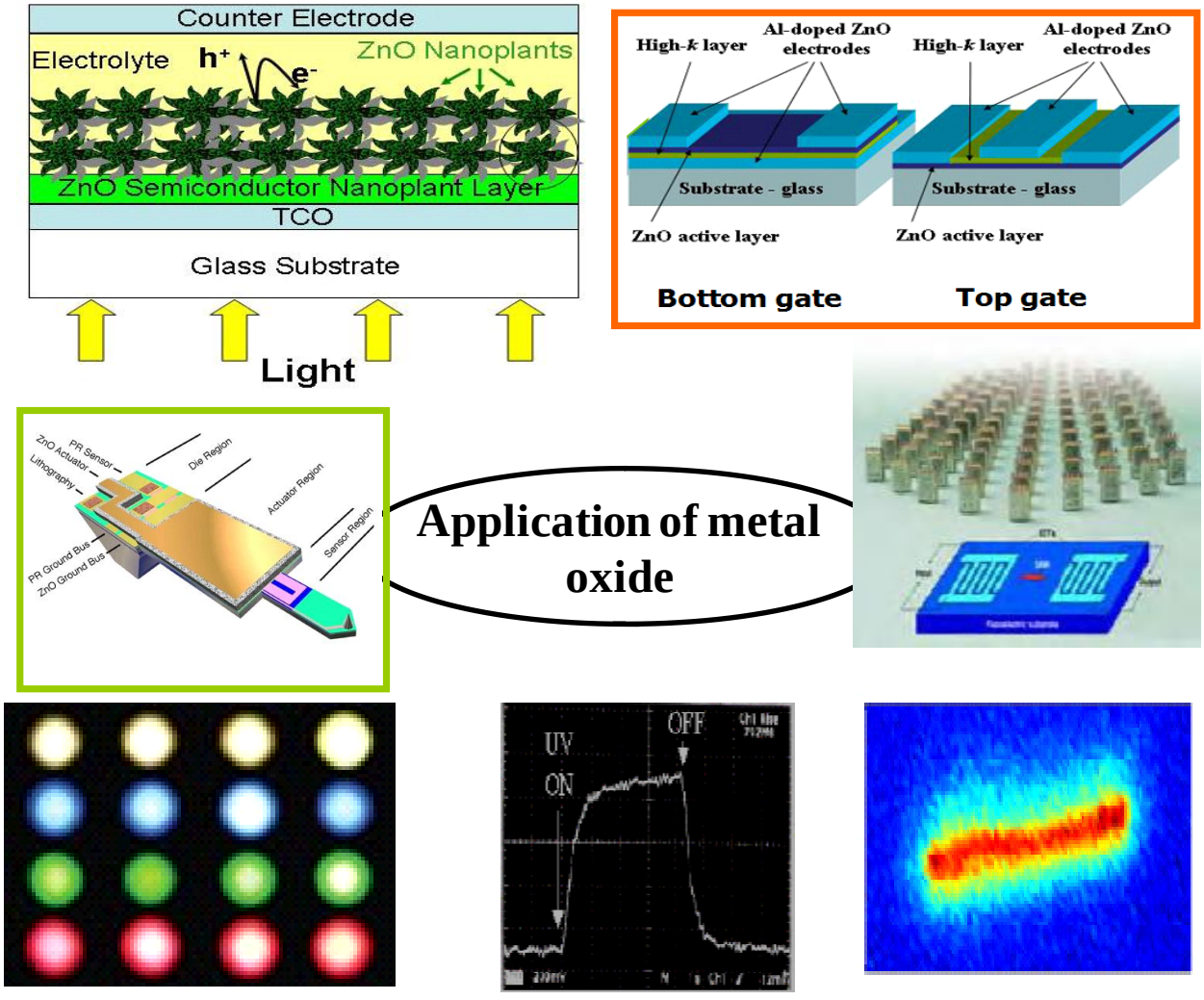

Figure 2: Application of metal oxide semiconductor.