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Recent Advances in 1D Micro- and Nanoscale Indium Oxide Structures

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Due to a variety of outstanding physical and chemical properties such as wide band gap, low resistance, good catalysis, high surface-to-volume ratio, high sensitivity and strong interaction with gas molecules, one-dimensional (1D) micro- and nanoscale indium oxide (In_2O_3) structures are capable for high-performance optical, electrical and chemical devices, which have attracted much attention in the last decade. In this paper, we first summarize various fabrication methods of 1D micro- and nanoscale In_2O_3 structures such as chemical vapor deposition, hydrothermal method, thermal evaporation method and electrospinning, then the interesting electrical and optical properties and their potential applications including gas sensors, field-emission transitions, photocatalysts and ultraviolet detectors are reviewed. At last, in order to fulfill the potential applications of 1D micro- and nanoscale In_2O_3 structures, some challenges have also been discussed.

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