

### Characteristics of unique surface textures of ZnO films deposited by chemical bath deposition at low temperature

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Generally TCO(Transparent conducting oxide)be used for ITO. but, ITO is very expensive and rare. for complement, many researchers studying for ZnO. ZnO have low process temperature and advantage of low cost. The unique surface textures of ZnO films grown by chemical bath deposition were presented. Both the zinc concentration and ethanol content in the chemical bath were found to affect the surface texture of ZnO films significantly. At certain growth conditions, the commonly observed textures derived from ZnO hexagonal rods evolve into unique shell-like textures. The shell-like surface textures are entirely different from the common textures in that the shape of grains is not hexagonal but rather round. A possible mechanism for the shell-like texture growth was discussed.