The synthesis of the transparent electrode structure with needle-like ZnO nanowires

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ZnO is an attractive material for its interesting semiconducting, optical, and piezoelectric properties. ZnO nanowires can be used to transparent electrode for cell stimulation because of their transparency and electrical conductivity. When ZnO nanowires are synthesized, their size and length are easily controlled and we can improve their conductivity by doping Al or Ga. In liquid phase reaction, the morphology of ZnO nanowires is dependent on the pH of solution. Over pH 10, the tip of nanowire becomes sharper, so we can make needle-like ZnO nano structure. In this experiment, we grew ZnO nanowires on transparent ITO/glass substrate with hydrothermal method. We synthesized Al-doped needle-like ZnO nanowires in alkali solution and then measured electrical conductivity of perpendicularly aligned ZnO nanowires on ITO/glass.