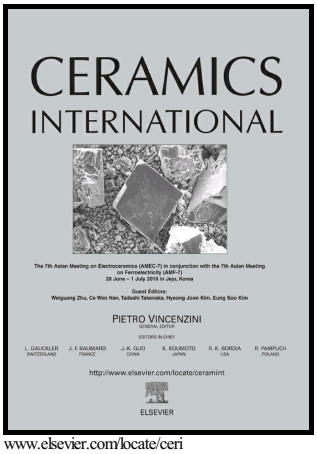

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Controllable Synthesis and Growth Mechanism of Lead free Bismuth Sodium Titanate Nanowires

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Abstract:

Highly uniform lead-free piezoelectric bismuth sodium titanate ($Na_{0.5}Bi_{0.5}TiO_3$, BNT) nanowires were successfully synthesized *via* a hydrothermal method. Synthesized at a stirring speed range of 300-1000 rpm, the compositions and orientations of BNT nanowires were well controlled. The effects of stirring speeds on the formation of BNT nanoparticles and nanowires in the hydrothermal processes were systematically investigated. The BNT nanowires with a high aspect ratio were proven to be single crystals with [110] growth direction from high-resolution TEM analysis. The mechanism of growth of BNT nanowires out of nanoparticles in the