

Electrodeposition of PbTe nanowire into porous anodic alumina templates

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PbTe has attracted considerable attention as one of the most efficiency thermoelectric material in the middle temperature range (500 – 900 K). Bulk PbTe has also high melting point, low vapor pressure and good chemical stability. In order to synthesize of vertical PbTe nanowire using the template assisted electrodeposition method, it is required to prepare a plating solution containing Pb and Te ions. However, it is very difficult because Te has a low solubility and relies heavily on pH range. In addition, the large reduction potential difference between Pb and Te is the another cause. In this work, we report that the use of complexing agent may be necessary to solve these problems.