

Abstract Submitted  
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**Synthesis and phase behavior of AgI atomicwires in carbon nanotubes** SHIN-ICHI ITO, RYO KITAURA, YASUMITSU MIYATA, HISANORI SHINOHARA, Nagoya University, HIROSHI KITAGAWA COLLABORATION, KUNIO AWAGA COLLABORATION —  $\alpha$ -phase silver iodide( $\alpha$ -AgI) has been well-known as a solid state ionic conductor due to its superionic conductivity and is one of the promising candidates for solid-state electrolytes for various electrochemical devices. Below 420 K,  $\alpha$ -AgI undergoes a phase transition into the poorly conducting  $\beta$ - and  $\gamma$ -polymorphs, thereby limiting their applications. Recently, we have found that AgI nanowires with a diameter of 10 nm can retain  $\alpha$ -phase even at 313 K where size and morphology of AgI presumably plays a great role in this  $\alpha$ -AgI stabilization [1]. To investigate the effect further, we have focused on low dimensional nanostructure of AgI with a diameter of 5 - 10 nm. For this purpose, one-dimensional (1D) nanospace of carbon nanotubes (CNTs) has been utilized. CNTs have unique 1D nanospace ranging in diameter from 0.4 to 50 nm, which can stabilize otherwise unstable nanomaterials. We have synthesized AgI@CNTs by the sublimation method already reported [2]. In the presentation, we will discuss detailed characterization of structure and properties based on electron beam diffraction and HR-TEM.

[1] R. Makiura et al., Nature.Mater.8, 476 (2009).

[2] R. Kitaura, et al., Nano Res.1, 152 (2008).

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