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Synthesis of NiNW/ Cellulose Nano Hybrid via Liquid-Phase Reduction

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Abstract : The 1D nanomaterial is far surpassed the 0D nanomaterial. It does not just offer most of the benefit of the 0D nanomaterial such as the large surface area, a great number of active site and an efficient interfacial charge transfer but also can assemble into free-standing and flexible electrode due to their high aspect ratio. Thus, it is essential to develop a simple and ease synthesis of this 1D nanomaterial for the practical application. Here, nickel nanowire/cellulose hybrid has been successfully fabricated via a simple liquid-phase method with the assist of the magnetic field. A finer nickel nanowire was heterogeneously nucleated on the surface of the cellulose fiber, which demonstrated the effect of the hydroxyl group on the cellulose structure. The result of the nickel nanowire size was found to vary from 66-114 nm. A detailed discussion on the mechanism of the nickel nanowire/ cellulose hybrid formation is also shown in this paper.

Keywords : cellulose nanofiber, liquid-phase reduction, metal nanowire, nano hybrid material
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