

Synthesis of silicon nanowires from Si powder and their electrophoretic fabrication

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Si nanowires have gained significant attention as a result of their potential applications in nanoelectronic, optoelectronic, and electromechanical devices. For these applications, many techniques are employed to synthesize and fabricate Si nanowires. Here, we report the synthesis of Si nanowires and the fabrication of Si nanowires-coated metal electrode by electrophoretic deposition.

First of all, to synthesize Si nanowires, we prepared Ni catalyst impregnated Si powder. After the reduction of nickel catalyst, Si nanowires were synthesized by annealing under reducing environment. The as-grown samples were ultrasonicated and centrifuged to detach Si nanowires from Si powders. Metal salts were added into the Si nanowires dispersed solution to modify the surface charge of Si nanowires for better electrophoretic deposition. Si nanowires-coated metal electrode was successfully fabricated by electrophoretic deposition technique.