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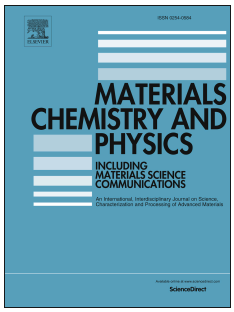

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Synthesis of cadmium chalcogenides nanowires via laser-activated gold catalysts in solution

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Abstract: Laser irradiation is a green, simple and efficient technique for material synthesis. A laser-activated-catalyst (LAC) technique is proposed for fabrication of nanowires in solution under ambient conditions. In the present work, effects of intrinsic influential factors such as the activity of precursor, precursor concentration, laser energy density and laser irradiation time on the LAC growth of cadmium chalcogenide nanowires are systematically investigated, which help to reveal the fundamental principles of LAC technique.Laser energy density and activity of precursor are proven to be vital for the growth of nanowires, and our work demonstrates that LAC is a universal way for synthesis of cadmium chalcogenides semiconductors.

Keywords: laser ablation; catalytic growth; nanowires

Introduction

Cadmium chalcogenides semiconductor nanowires can be widely applied in nanoscale optoelectronics [1-3], transistors [4, 5], photodetectors [6, 7] and sensors [8-11]. To date, various techniques have been developed to grow cadmium chalcogenides nanowires, such as template growth [12], oriented attachment [13-16], and catalytic growth [17-20]. Among them, catalytic growth in solution (CGS) possesses unique advantages, such as inexpensive precursors, low growing

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