



Industrial-Scale Glass Micro-Reactors for Flow Chemistry Applications Fabricated by Laser 3D Printing

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Over the past decades, ultrafast laser internal modification has become a widely adopted approach to enable three-dimensional (3D) micromachining of transparent materials into sophisticated structures and devices with extreme geometrical flexibility. For the industrial-scale applications of complex devices based on hard and brittle materials like glasses and ceramics, direct fabrication by laser 3D printing is still elusive. We report on a high-resolution, high-throughput ultrafast laser 3D printing method for industrial-scale micro-reactors in glass, utilizing the extreme spatial-temporal manipulation of laser-material interactions deep inside the transparent material [1]. The fabricated glass micro-reactors with sophisticated 3D microfluidic channels and large liquid holding volume usher a revolution in flow-chemistry applications, evidenced by their applications in high-throughput and high-performance continuous-flow synthesis of advanced pharmaceutical and chemical products [2-4].

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References:

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