High-Resolution 3D-Printed Metal Numbering-up Microreactor for Increased Productivity of Ultrafast Synthesis

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We fabricated a high-resolution 3D-printed stainless steel numbering-up microreactor to increase the productivity of a single-capillary microreactor by a factor of four. The same efficiency of a single-capillary microreactor and a numbering-up microreactor was confirmed by simulating the distribution and mixing efficiency of inlet solutions and by comparing the yield of desired products. Additionally, a 16-times increase in productivity was achieved for the synthesis of a key intermediate of letrozole by stacking four numbering-up microreactors. The fabricated numbering-up microreactor enabled the productivity increase of ultrafast reactions by resolving the problems of pressure drop and mixing efficiency reductione.