Fabrication of size-tunable hierarchical porous Cr nanoring arrays by modified nanosphere lithography

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Abstract

This study presents a low-cost and high-throughput strategy for fabricating size-tunable hierarchical porous Cr nanoring arrays using modified
nanosphere lithography-based technology. The period and diameter of the Cr nanorings can be easily controlled by the initial diameter of the self-assembled nanospheres and the following Cr coating and reactive ion-etching processes. The wettability can be manipulated by changing the pore size and the height of the nanorings. The optical transmittance of the periodic porous Cr nanoring arrays was enhanced because of a surface plasmon resonance effect. This new approach will surely facilitate further exploration of the structure of hierarchical porous Cr nanoring arrays for potential applications in interesting scientific fields such as optical sensors and electro-optic devices.

Keyword：porous Cr arrays , nanosphere lithography , size-tunable hierarchical