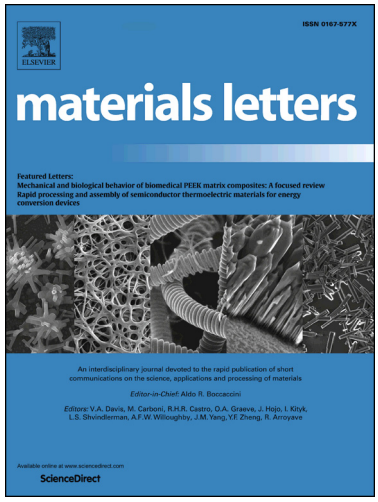

Facile fabrication of surfactant-templated silica membrane on porous alumina support

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Facile fabrication of surfactant-templated silica membrane on porous alumina support

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Abstract

We report a unique technique for fabricating a uniform and crack-free surfactant-templated silica membrane on a porous alumina support. The porous alumina support was first subjected to a heat-sealing treatment, and then a mesoporous silica membrane derived from a surfactant template was deposited thereon by sol–gel processing. The surface topography of the silica membrane has been characterized. With the aid of the sealing procedure, an air-cushion was formed to provide sufficient additional supporting force to support the precursor film and prevent permeation of the precursor into the pores. The sol–gel deposition on the porous alumina support formed a uniform, crack-free silica membrane.

Keywords: Inorganic membranes; Porous support; Heat-sealing treatment; Sol–gel preparation; Thin films;

1. Introduction

Inorganic membranes have attracted a great deal of attention due to their superior mechanical strength and thermal and chemical stabilities [1]. Consequently, they are used in many fields, such as liquid and gas