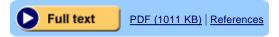


## Fabrication and characteristics of porous germanium films

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**Abstract.** Porous germanium films with good adhesion to the substrate were produced by annealing  ${\rm GeO}_2$  ceramic films in  ${\rm H}_2$  atmosphere. The reduction of  ${\rm GeO}_2$  started at the top of a film and resulted in a Ge layer with a highly porous surface. TEM and Raman measurements reveal small Ge crystallites at the top layer and a higher degree of crystallinity at the bottom part of the Ge film; visible photoluminescence was detected from the small crystallites. Porous Ge films exhibit high density of holes ( $10^{20}~{\rm cm}^{-3}$ ) and a maximum of Hall mobility at ~225 K. Their p-type conductivity is dominated by the defect scattering mechanism.

Keywords: germanium, porous structured film, visible photoluminescence, semiconducting behavior

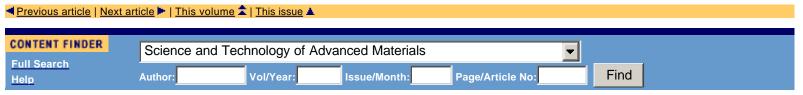
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