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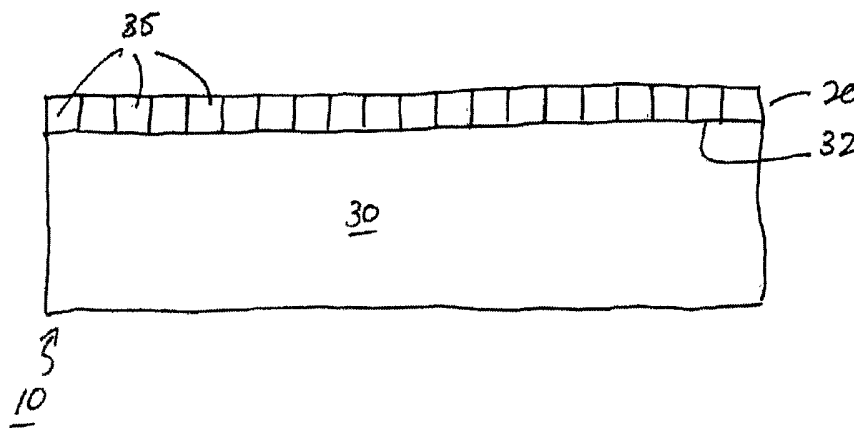
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(54) Title: CRYSTALLINE MEMBRANES



(57) Abstract: In certain aspects, the invention features methods for forming crystalline membranes (20) (e.g., a membrane of a framework material, such as a zeolite) by inducing secondary growth in a layer of oriented seed crystals (32). The rate of growth of the seed crystals in the plane of the substrate (30) is controlled to be comparable to the rate of growth out of the plane. As a result, a crystalline membrane can form a substantially continuous layer including grains (35) of uniform crystallographic orientation that extend through the depth of the layer.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/06950

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(7) : C30B 7/10, 7/08, 7/02, 29/34
 US CL : 117/68, 69, 70, 72; 423/328, 329; 422/105
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 117/68, 69, 70, 72; 423/328, 329; 422/105

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	LOVALLO, M.C., Synthesis and characterization of oriented MFI membranes prepared by secondary growth, AIChE Journal August 1998, Vol 44, no. 8 pages 1903-1913.	1-12
Y	HEDLUND, J., Controlling the preferred orientation in silicalite-1 films synthesized by seeding, Microporous and Mesoporous Materials vol. 28 (1999) pages 185-194 note especially page 188.	
A	BEIN, T., Synthesis and applications of molecular sieve layers and membranes, Chem. Mater. vol. 8 no. 8 1996 pages 1636-1653.	1-12
A	JP 11-199384 A (MAEDA et al) 27 July 1999 (27.07.1999).	
A	US 3,936,276 (BALITSKY et al) 3 February 1976 (03.02.1976).	
Y	US 4,021,294 (KHADZHI et al) 3 May 1977 (03.05.1977), note column 3 lines 1-30.	

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T"
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