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(54) Title: MEMBRANES AND CATALYSTS FOR FUEL CELLS, GAS SEPARATION CELLS, ELECTROLYZERS AND SOLAR HYDROGEN APPLICATIONS

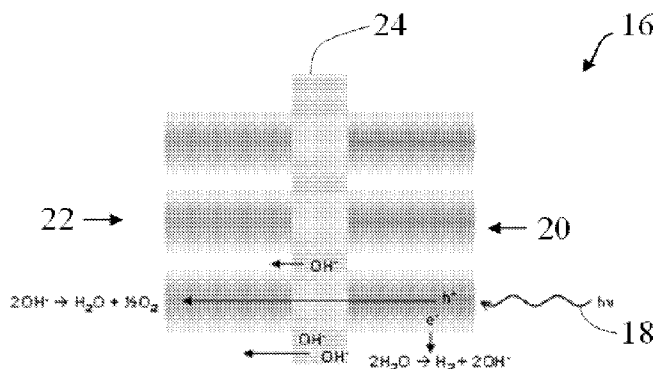


FIG. 32

(57) Abstract: Oxygen reduction catalysts for fuel cells are provided. The catalyst can be based on platinum-coated palladium nanotubes, or multiple twinned, crystalline silver nanowires. Also provided is a method of removing carbon dioxide using a membrane having basic functional groups, and a method of water electrolysis using a membrane having basic functional groups.





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A. CLASSIFICATION OF SUBJECT MATTER**C25B 1/04(2006.01)i, H01M 8/04(2006.01)i, H01M 8/10(2006.01)i**

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)

C25B 1/04; C25B 9/00; B01J 41/12; B01D 69/12; H01M 8/10; H01M 8/22; H01M 4/02; B01D 69/00; C08G 75/23; H01M 4/88; H01M 8/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & keywords: water, electrolysis, hydroxide exchange membrane, platinum, carbon dioxide, palladium

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2007-0119706 A1 (MCNULTY, THOMAS FRANCIS et al.) 31 May 2007 See paragraphs [0002], [0014], [0019]-[0028]; claims 1-20; and figures 3-4	1-15
A		16-42
Y	US 2011-0237690 A1 (YAN, YUSHAN et al.) 29 September 2011 See paragraphs [0003], [0007]-[0008], [0020]-[0024], [0046]-[0048], [0064], TABLE 8; claims 1, 10, 24-25; and figure 1.	1-15, 18-19, 21-28
X	JP 2010-214324 A (PETROLEUM ENERGY CENTER et al.) 30 September 2010 See paragraphs [0042]-[0052], [0070]-[0071]; claim 1; and figure 1.	16-17, 20
Y		18-19
X	US 2009-0220835 A1 (YAN, YUSHAN et al.) 3 September 2009 See paragraphs [0025], [0065]-[0067], [0074]-[0077], [0083]-[0089], [0109], [0111]; claims 12-24; and figures 8-9.	29-42
Y		21-28
A	US 2010-0323249 A1 (FUJIWARA, NAOKO et al.) 23 December 2010 See paragraphs [0019], [0031]-[0040]; claims 1-9; and figures 1-2.	1-42

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

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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