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(54) Title: SYNTHESIS OF POROUS CARBON-BASED MATERIALS FROM EXPANDED POLYSTYRENE (EPS) OR STYRO-FOAM

(57) Abstract: A process for synthesizing a carbon molecular sieve and an activated carbon from expanded polystyrene is provided. The process includes sulfonating the expanded polystyrene with sulfuric acid in the presence of chlorobenzene, to obtain sulfonated polystyrene; carbonizing the sulfonated polystyrene to obtain a carbon molecular sieve (CMS) with a substantially high degree of porosity, and activating the CMS by an activating agent to obtain activated carbon. A low temperature of, for example, about 50 degrees Celsius, is employed for sulfonating the expanded polystyrene. Heating and cooling operations in the steps of synthesizing the CMS are performed under a nitrogen gas atmosphere.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. C08F 8/36, D01F 9/21, D01F 9/14, C08J 11/08 (2024.01)
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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)

See Search History document

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

See Search History document

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

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- A	CN 111224100 A (Beijing Institute of Nanoenergy and Nanosystems) 02 June 2020 (02.06.2020); entire document, especially abstract, pg 2 para 17, pg 3 para 8-9, pg 3 para 15, pg 5 para 15-18	1, 8-14 ----- 2-7
Y --- A	KR 20220115553 A (KIM) 17 August 2022 (17.08.2022); entire document, especially abstract, pg 6 para 9	1, 8-14 ----- 2-7
A	US 7,728,047 B2 (Notari et al.) 01 June 2010 (01.06.2010); entire document	1-14
A	US 8,546,455 B2 (Poutch et al.) 01 October 2013 (01.10.2013); entire document	1-14
A	US 4,020,145 A (Soehngen et al.) 26 April 1977 (26.04.1977); entire document	1-14

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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