

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: **84300780.8**

(51) Int. Cl.⁴: **C 10 M 3/00**
D 01 F 9/14

(22) Date of filing: **07.02.84**

(30) Priority: **08.02.83 JP 19168/83**
08.02.83 JP 19169/83

(43) Date of publication of application:
29.08.84 Bulletin 84/35

(88) Date of deferred publication of search report: **17.04.85**

(84) Designated Contracting States:
DE FR GB

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(54) **Novel carbonaceous pitch, process for the preparation thereof and use thereof to make carbon fibers.**

(57) A novel reformed mesophase pitch is provided which has a mesophase content MC of between 40 and 100 %, a quinoline-insoluble content QI of between 5 and 70 weight % and anisotropic domains forming a substantially continuous phase and which is obtained by heat-treating a hydrogenated isotropic pitch. The reformed mesophase pitch preferably has a softening point SP in °C satisfying the following conditions:

when

$40 \leq MC < 100$,
 $0.4MC + 170 \leq SP \leq 1.25MC + 170$ and
 $SP \leq 1.33QI + 220$ and when
 $MC = 100$, $210 \leq SP \leq 313$ and
 $SP \leq 1.33QI + 220$.

The reformed mesophase pitch is useful as precursor materials for carbon fibers.



European Patent
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EUROPEAN SEARCH REPORT

0117099

Application number

EP 84 30 0780

DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl. 3) |
|--|---|--|--|
| X | EP-A-0 063 051 (NIPPON OIL) * Page 9, lines 25-30; page 10, lines 1-29; page 13, lines 15-25 * | 1,4,5,6,8,15,16,17 | C 10 C 3/00 D 01 F 9/14 |
| A | --- US-A-4 312 742 (KIYOSHIGE HAYASHI) * Column 1, lines 42-68; column 2, lines 1-39; column 6, line 34; column 8, lines 14-52; column 9, lines 15-68 * | 1,6,8,15,17 | |
| A | --- EP-A-0 054 437 (FUJI STANDARD RESEARCH) * Page 5, lines 20-35; page 6, lines 1-35; page 10, lines 26-34; page 11, lines 4-35 * | 1,3,7,10,11,12,13,15,16,17 | TECHNICAL FIELDS SEARCHED (Int. Cl. 3) C 10 C D 01 F |
| A | --- DE-A-1 966 045 (KUREHA KAGAKU KOGYO K.K.) * Page 3, paragraph 4; page 4, paragraphs 1,2; page 6, paragraph 2 * | 1,7,13 | |
| A | --- DE-A-1 930 713 (KUREHA KAGAKU KOGYO K.K.) * Pages 11,12, example 4 * | 1,16,17 | |
| --- -/- | | | |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 31-10-1984 | Examiner KERRES P.M.G. |

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|---|--|--|--|
| Category | Citation of document with indication where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl. 3) |
| A | EP-A-0 044 714 (TOA NENRYO KOGYO K.K.) * Page 19, lines 11-29; page 20, table 1 * | 2,9 | |
| E | FR-A-2 512 076 (MITSUI COKE CO.) * Page 4, lines 27-36; page 5, lines 1-32; page 6, lines 16-22 * | 1,8,15 ,16,17 | |
| E | EP-A-0 072 573 (MITSUBISHI OIL) * Page 13, lines 1-14; page 16, table 1 * | 1,6,16 ,37 | |
| The present search report has been drawn up for all claims | | | TECHNICAL FIELDS SEARCHED (Int. Cl. 3) |
| Place of search THE HAGUE | | Date of completion of the search 31-10-1984 | Examiner KERRES P.M.G. |
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