

Global Patent Data (GPD) コレクションの拡張の一環として、Derwent Innovation で原文特許 (PDF) の検索ができるようになりました。

アルファベット以外の現地言語でも検索ができます。

これにより、検索箇所を迅速に検索することができ、検索時間の節約に繋がります。

ページ内の検索 lithium battery

検索したいワードを入力します

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linity closer to graphite but is not ... and thus large-size graphene forms fault like shapes ... large amount of lithium ions may go in and out of ... shaped cracks along the fault like shapes. As the ... is higher, the carbon component shows surface ... amorphous carbon and the D/I of perfect amorphous carbon is difficult to measure.

[0110] The amorphous carbon has ... of atomic pores rather than a large amount of cracks ... which lithium ions are allowed to go in and out.

[0111] While this disclosure has ... described in connection with what is presently ... to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments and is intended to cover various arrangements included within the scope of the appended claims. In the ... "Example," and "Comparative Example" are used to identify a particular example or experimentation and should not be interpreted as admission of prior art.

What is claimed is:

1. A negative active material for a rechargeable **lithium battery** comprising a carbon component having a ratio ( $I_{1360}/I_{1620}$ ) of a peak intensity ( $I_{1360}$ ) at  $1360\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  ranging from about 1 to about 4.5 measured by Raman spectroscopy.

2. The negative active material of claim 1, wherein the carbon component has a ratio ( $I_{1360}/I_{1620}$ ) of a peak intensity ( $I_{1360}$ ) at  $1360\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  ranging from about 1.1 to about 4.4 in Raman spectroscopy.

3. The negative active material of claim 2, wherein the carbon component has a ratio ( $I_{1360}/I_{1620}$ ) of a peak intensity ( $I_{1360}$ ) at  $1360\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  ranging from about 1.2 to about 4.3 in Raman spectroscopy.

4. The negative active material of claim 1, wherein the carbon component has a ratio ( $I_{1620}/I_{1580}$ ) of a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1580}$ ) at  $1580\text{ cm}^{-1}$  ranging from about 0.01 to about 0.5 in Raman spectroscopy.

5. The negative active material of claim 1, wherein the carbon component is a composite carbon material comprising:

- carbon including crystalline carbon and
- surface-damaged carbon having defects on the surface of the core carbon and including amorphous carbon.

6. The negative active material of claim 5, wherein the ratio ( $I_{1620}/I_{1580}$ ) of a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1580}$ ) at  $1580\text{ cm}^{-1}$  has a substantially predetermined value in Raman spectroscopy of the composite carbon material regardless of an amount of the surface-damaged carbon.

7. The negative active material of claim 5, wherein the core carbon has an average particle diameter (D50) of about  $3\text{ }\mu\text{m}$  to about  $50\text{ }\mu\text{m}$ .

8. The negative active material of claim 5, wherein the surface-damaged carbon is present in an amount of about 0.5 wt % to about 8.5 wt % based on the total weight of the composite carbon material.

9. The negative active material of claim 5, wherein the surface-damaged carbon may include soft carbon, hard carbon or a combination thereof.

10. The negative active material of claim 5, wherein the core carbon comprises natural graphite, artificial graphite, or a combination thereof.

11. The negative active material of claim 9, wherein the soft carbon is obtained from coal pitch, petroleum pitch, polyvinylchloride, mesophase pitch, tar, low molecular weight heavy oil, or a combination thereof, and

lulose, hydroxypropyl cellulose, regenerated cellulose, polyvinylpyrrolidone, polyethylene, polypropylene, an ethylene-propylene-diene monomer (EPDM), polyacrylic acid, sodium polyacrylate, polyacrylonitrile, glucose, gelatin, a saccharide, a phenolic resin, a naphthalene resin, a polyamide resin, a furan resin, a polyimide resin, a cellulose resin, a styrene resin, an epoxy resin and vinyl chloride resin, or a combination thereof.

12. A negative electrode for a rechargeable **lithium battery** including the negative active material of claim 1.

13. The negative electrode for the rechargeable **lithium battery** of claim 12 wherein the negative active material comprises a carbon component having a ratio ( $I_{1360}/I_{1620}$ ) of a peak intensity ( $I_{1360}$ ) at  $1360\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  ranging from about 1 to about 4.5 measured by Raman spectroscopy.

14. The negative electrode for the rechargeable **lithium battery** of claim 12 wherein the negative active material comprises a carbon component having a ratio ( $I_{1360}/I_{1620}$ ) of a peak intensity ( $I_{1360}$ ) at  $1360\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  ranging from about 1.1 to about 4.4 in Raman spectroscopy.

15. The negative electrode for the rechargeable **lithium battery** of claim 12 wherein the negative active material comprises a carbon component having a ratio ( $I_{1360}/I_{1620}$ ) of a peak intensity ( $I_{1360}$ ) at  $1360\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  ranging from about 1.2 to about 4.3 in Raman spectroscopy.

16. The negative electrode for the rechargeable **lithium battery** of claim 12 wherein the negative active material comprises a carbon component having a ratio ( $I_{1620}/I_{1580}$ ) of a peak intensity ( $I_{1620}$ ) at  $1620\text{ cm}^{-1}$  relative to a peak intensity ( $I_{1580}$ ) at  $1580\text{ cm}^{-1}$  ranging from about 0.01 to about 0.5 in Raman spectroscopy.

17. A rechargeable **lithium battery** comprising the negative electrode of claim 12, a positive electrode, and an electrolyte solution.

※検索する場合は、PDF をダウンロードしてください。

今回、原文特許 (PDF) 検索が可能になった対象国は、以下の通りとなります。

| 原文特許（PDF）検索 |                     |
|-------------|---------------------|
| 対象国         | 対象レコード              |
| PCT         | DI収録レコード全て          |
| 欧州          | DI収録レコード全て          |
| フランス        | DI収録レコード全て          |
| 英国          | DI収録レコード全て          |
| カナダ         | 1978年以降-現在までの収録レコード |
| 米国          | 1976年以降-現在までの収録レコード |
| ブラジル        | DI収録レコード全て          |
| メキシコ        | DI収録レコード全て          |
| アルゼンチン      | DI収録レコード全て          |

2019年9月には、中国、ドイツ（1987年から現在）、ロシア、オーストラリア（1990年から現在）、ベトナム、インドネシア、タイ、マレーシア、シンガポールでも検索可能なPDFをリリースする予定です。

Derwent Innovation は、お客様の業務が大幅に改善できるように今後もさまざまな開発、リリースに努めてまいりますので、ご期待ください。