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(54) **CURRENT COLLECTOR PROTECTIVE GLUE**

(57) A current collector protective glue includes a solvent and an adhesive. The solvent is selected from one or more of water, ethanol, NMP, acetone, and butanone.

The adhesive is selected from one or more of cellulose, polyacrylic acid, styrene-butadiene rubber, styrene butadiene rubber, and nitrile rubber.

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Description

BACKGROUND

5 Technical Field

[0001] The disclosure relates to a protective glue, and more particularly, to a current collector protective glue.

Description of Related Art

10 **[0002]** Generally speaking, a protective tape is usually attached to a current collector in an electric core to protect the current collector. However, this method has poor coverage and is difficult to completely cover, and an adhesive of the tape itself is also prone to side reactions with the electrolyte, causing issues such as the open circuit or short circuit of the current collector, which will adversely affect the service life and performance of the electric core.

15 SUMMARY

[0003] The disclosure provides a current collector protective glue, which may improve service life and performance of an electric core.

20 **[0004]** A current collector protective glue in the disclosure includes a solvent and an adhesive. The solvent is selected from one or more of water, ethanol, 1-Methyl-2-pyrrolidone, acetone, and butanone. The adhesive is selected from one or more of cellulose, polyacrylic acid, styrene-butadiene rubber, styrene butadiene rubber, and nitrile rubber.

[0005] In an embodiment of the disclosure, a weight percentage of the solvent in the current collector protective glue ranges from 30% to 95%.

25 **[0006]** In an embodiment of the disclosure, a weight percentage of the adhesive in the current collector protective glue ranges from 5% to 70%.

[0007] In an embodiment of the disclosure, the current collector protective glue is formed by liquid heating and curing.

[0008] In an embodiment of the disclosure, the current collector protective glue is not in a form of a sheet.

[0009] In an embodiment of the disclosure, the current collector protective glue is a non-attached tape.

30 **[0010]** In an embodiment of the disclosure, a weight percentage of the adhesive in the current collector protective glue is greater than a weight percentage of the solvent in the current collector protective glue.

[0011] In an embodiment of the disclosure, the current collector protective glue is an insulating material.

[0012] In an embodiment of the disclosure, a resistance value of the current collector protective glue is at least greater than 10^9 ohm/meter.

35 **[0013]** In an embodiment of the disclosure, the current collector protective glue is only formed by the solvent and the adhesive.

[0014] Based on the above, the current collector protective glue in the disclosure is selected by the material, that is, the current collector protective glue includes the solvent and the adhesive. The solvent is selected from one or more of water, ethanol, 1-Methyl-2-pyrrolidone, acetone, and butanone, while the adhesive is selected from one or more of cellulose, polyacrylic acid, styrene-butadiene rubber, styrene butadiene rubber, and nitrile rubber. In this way, the current collector protective glue may cover the current collector more completely to reduce the probability of side reactions, effectively protect the current collector, and avoid the current collector from contacting the electrolyte and not participating in the electric core reaction. Therefore, the service life and performance of the electric core may be improved.

40 **[0015]** In order for the aforementioned features and advantages of the disclosure to be more comprehensible, embodiments accompanied with drawings are described in detail below.

DETAILED DESCRIPTION OF DISCLOSED EMBODIMENTS

50 **[0016]** Hereinafter, embodiments of the disclosure are described in detail. However, the embodiments are exemplary. The disclosure is not limited thereto, and the disclosure is defined by the scope of the claims.

[0017] A current collector protective glue in this embodiment is selected by a material, that is, the current collector protective glue includes a solvent and an adhesive. The solvent is selected from one or more of water, ethanol, 1-Methyl-2-pyrrolidone, acetone, and butanone, while the adhesive is selected from one or more of cellulose, polyacrylic acid, styrene-butadiene rubber, styrene butadiene rubber, and nitrile rubber. In this way, the current collector protective glue may cover a current collector (such as a pole tab and a pole lug) to reduce the probability of side reactions, effectively protect the current collector, and avoid the current collector from contacting electrolyte and not participating in an electric core reaction. Therefore, service life and performance of an electric core may be improved. It should be noted that as long as the solvent and the adhesive are selected from at least one of the above categories, the solvent and the adhesive

fall within the scope of the disclosure.

[0018] Further, the side reaction may be a corrosion reaction in which the electrolyte in the electric core corrodes the current collector (such as metal). Therefore, when the side reaction occurs, the current collector protective glue will be destroyed or even dissolved, thereby reducing protective efficacy of the current collector protective glue. In this embodiment, since the selected material of the adhesive is substantially not corroded by the electrolyte, the probability of side reactions may be reduced to effectively protect the current collector and avoid the current collector from contacting the electrolyte and not participating in the electric core reaction. Therefore, the service life and performance of the electric core may be improved.

[0019] In some embodiments, a weight percentage of the solvent in the current collector protective glue ranges from 30% to 95%. For example, the weight percentage of the solvent in the current collector protective glue may be 30%, 40%, 50%, 60%, 70%, 80%, 90%, 95%, or any value from 30% to 95%. A weight percentage of the adhesive in the current collector protective glue ranges from 5% to 70%. For example, the weight percentage of the adhesive in the current collector protective glue may be 5%, 10%, 20%, 30%, 40%, 50%, 60%, 70% or any value from 5% to 70%. However, the disclosure is not limited thereto.

[0020] In some embodiments, the current collector protective glue may be formed by liquid heating and curing. In other words, the current collector protective glue may be first coated, adhered, or poured on the current collector in a liquid form to completely cover the current collector. Next, heating is performed to cure a liquid material to form a thin film. Therefore, the current collector protective glue in this embodiment is not in a form of a sheet. For example, the current collector protective glue in this embodiment is a non-attached tape. However, the disclosure is not limited thereto.

[0021] In some embodiments, the weight percentage of the solvent in the current collector protective glue and the weight percentage of the adhesive in the current collector protective glue are optionally designed. For example, the weight percentage of the adhesive in the current collector protective glue is greater than the weight percentage of the solvent in the current collector protective glue. Therefore, fluidity of the uncured liquid current collector protective glue may be reduced to reduce difficulties in operation. However, the disclosure is not limited thereto. The weight percentage of the adhesive in the current collector protective glue and a weight percentage of the current collector protective glue may depend on actual design requirements.

[0022] In some embodiments, the current collector protective glue is an insulating material to avoid short circuit caused by the current collector protective glue due to conduction. For example, a resistance value of the current collector protective glue is at least greater than 10^9 ohm/meter (Ω/m). However, the disclosure is not limited thereto.

[0023] In some embodiments, the current collector protective glue is only formed by the solvent and the adhesive. In other words, the current collector protective glue may substantially not have additives other than the solvent and the adhesive, but the disclosure is not limited thereto.

[0024] In some embodiments, the current collector protective glue may be matched in the following combinations, as shown in Table 1.

Table 1

Combinations	Solvent	Adhesive
1	water	cellulose, styrene butadiene rubber
2	water, 1-Methyl-2-pyrrolidone	polyacrylic acid, styrene butadiene rubber
3	ethanol, 1-Methyl-2-pyrrolidone	cellulose, polyacrylic acid, nitrile rubber
4	1-Methyl-2-pyrrolidone, butanone	cellulose, polyacrylic acid, styrene-butadiene rubber

[0025] It should be noted that the above combinations are only exemplary, and the current collector protective glue in the disclosure may be arbitrarily combined with the above solvent and adhesive in a suitable ratio, as long as the current collector protective glue includes at least one solvent and at least one adhesive. It falls within the scope of the disclosure that the solvent is selected from one or more of water, ethanol, 1-Methyl-2-pyrrolidone, acetone, and butanone, and the adhesive is selected from one or more of cellulose, polyacrylic acid, styrene-butadiene rubber, styrene butadiene rubber, and nitrile rubber.

[0026] Based on the above, the current collector protective glue in the disclosure is selected by the material, that is, the current collector protective glue includes the solvent and the adhesive. The solvent is selected from one or more of water, ethanol, 1-Methyl-2-pyrrolidone, acetone, and butanone, while the adhesive is selected from one or more of cellulose, polyacrylic acid, styrene-butadiene rubber, styrene butadiene rubber, and nitrile rubber. In this way, the current collector protective glue may cover the current collector more completely to reduce the probability of side reactions, effectively protect the current collector, and avoid the current collector from contacting the electrolyte and not participating in the electric core reaction. Therefore, the service life and performance of the electric core may be improved.

Claims

1. A current collector protective glue, comprising:

5 a solvent, wherein the solvent is selected from one or more of water, ethanol, 1-Methyl-2-pyrrolidone, acetone, and butanone; and
an adhesive, wherein the adhesive is selected from one or more of cellulose, polyacrylic acid, styrene-butadiene rubber, styrene butadiene rubber, and nitrile rubber.

10 2. The current collector protective glue according to claim 1, wherein a weight percentage of the solvent in the current collector protective glue ranges from 30% to 95%.

15 3. The current collector protective glue according to claim 1, wherein a weight percentage of the adhesive in the current collector protective glue ranges from 5% to 70%.

4. The current collector protective glue according to claim 1, wherein the current collector protective glue is formed by liquid heating and curing.

20 5. The current collector protective glue according to claim 1, wherein the current collector protective glue is not in a form of a sheet.

6. The current collector protective glue according to claim 5, wherein the current collector protective glue is a non-attached tape.

25 7. The current collector protective glue according to claim 1, wherein a weight percentage of the adhesive in the current collector protective glue is greater than a weight percentage of the solvent in the current collector protective glue.

30 8. The current collector protective glue according to claim 1, wherein the current collector protective glue is an insulating material.

9. The current collector protective glue according to claim 8, wherein a resistance value of the current collector protective glue is at least greater than 10^9 ohm/meter.

35 10. The current collector protective glue according to claim 1, wherein the current collector protective glue is only formed by the solvent and the adhesive.

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EUROPEAN SEARCH REPORT

Application Number

EP 22 20 8986

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 111 916 645 A (JIANGSU TAFEL NEW ENERGY TECH CO LTD ET AL.) 10 November 2020 (2020-11-10) * claims 6, 8, 13, 14 * * examples 1-12 * * comparative examples 1,2 * * paragraphs [0045], [0053], [0054] * -----	1-10	INV. C09D109/02 C09D109/06 C09D133/02 C09J109/02 C09J109/06 C09J133/02 H01M4/04
X	DIEHM RALF ET AL: "High-Speed Coating of Primer Layer for Li-Ion Battery Electrodes by Using Slot-Die Coating", ENERGY TECHNOLOGY, vol. 8, 2 July 2020 (2020-07-02), page 2000259, XP055960433, DOI: 10.1002/ente.202000259 * pages 2, 6, 7; table 1 * -----	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			C09J C09D H01M C08L
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 April 2023	Examiner Arz, Marius
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 111916645 A	10-11-2020	NONE	

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