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(54) **METHOD FOR IMPROVING RECOVERY RATE OF RECYCLED BIS(2-HYDROXYETHYL) TEREPHTHALATE**

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(58) **Field of Classification Search**
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,211,193 B2 * 5/2007 Inada C07C 67/54
528/308.1
9,255,194 B2 2/2016 Allen et al.

FOREIGN PATENT DOCUMENTS

CN	100344604	C	10/2007
CN	105367415	A	3/2016
CN	110590551	A	12/2019
CN	112724019	A	4/2021
CN	112898155	A	6/2021
JP	2005264113	A	9/2005
JP	2008-88096	†	4/2008
JP	200888096	A	4/2008
WO	WO01019775	A1	3/2001

* cited by examiner

† cited by third party

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(57) **ABSTRACT**

A method for improving a recovery rate of recycled bis(2-hydroxyethyl) terephthalate (BHET) is provided, which includes: providing a recycled polyester fabric; using a chemical de-polymerization liquid to chemically depolymerize the recycled polyester fabric, so as to form a de-polymerization product containing BHET; dissolving the BHET in water to form an aqueous phase liquid; cooling the aqueous phase liquid from a dissolution temperature to a first crystallization temperature, so as to crystallize at least a part of the BHET; and cooling the aqueous phase liquid from the first crystallization temperature to a second crystallization temperature, so as to crystallize at least another part of the BHET.

12 Claims, 1 Drawing Sheet