## PATENT COOPERATION TREATY

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

<table>
<thead>
<tr>
<th>Applicant’s or agent’s file reference</th>
<th>FOR FURTHER ACTION</th>
<th>See item 4 below</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP15003J</td>
<td>International filing date <em>(day/month/year)</em></td>
<td>Priority date <em>(day/month/year)</em></td>
</tr>
<tr>
<td>PCT/KP2015/000039</td>
<td>01 November 2015 (01.11.2015)</td>
<td>09 June 2015 (09.06.2015)</td>
</tr>
</tbody>
</table>

**International Patent Classification (8th edition unless older edition indicated)**

See relevant information in Form PCT/ISA/237

**Applicant**

Ri, Jong Hwa

---

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

   - [X] Box No. I Basis of the report
   - [ ] Box No. II Priority
   - [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - [ ] Box No. IV Lack of unity of invention
   - [X] Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - [ ] Box No. VI Certain documents cited
   - [ ] Box No. VII Certain defects of the international application
   - [ ] Box No. VIII Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis.2).

---

**Date of issuance of this report**

12 December 2017 (12.12.2017)

**Authorized officer**

Kihwan Moon

e-mail: pct.team1@wipo.int

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. +41 22 338 82 70

Form PCT/IB/373 (January 2004)
PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
China TAEDONGGANG Patent & Trademark
Law Office P.O.Box 777 Kaeson-dong, Moranbong
District, Pyongyang, Democratic People’s Republic of
Korea

JO Song Chol

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) 06 June 2016

Applicant’s or agent’s file reference TP15003J

FOR FURTHER ACTION
See paragraph 2 below

International application No. PCT/KP2015/000039
International filing date (day/month/year) 01 November 2015
Priority date (day/month/year) 06 September 2015

International Patent Classification (IPC) or both national classification and IPC
C01C 3/10(2006.01)

Applicant RI Jong Hwa et al

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority (“IPEA”) except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/STATE INTELLECTUAL PROPERTY OFFICE OF THE P.R.CHINA

Date of completion of this opinion 31 May 2016

Authorized officer SHI, Weiliang

Facsimile No. (86—10) 62019451

Form PCT/ISA/237 (Cover sheet) (July 2011)

Telephone No. (86-10) 62085011
1. With regard to the **language**, this opinion has been established on the basis of:
   - ✔️ the international application in the language in which it was filed.
   - ☐ a translation of the international application into __________________________ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a)).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
   a. (means)
      - ☐ on paper
      - ☐ in electronic form
   b. (time)
      - ☐ in the international application as filed
      - ☐ together with the international application in electronic form
      - ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:
1. Statement

<table>
<thead>
<tr>
<th></th>
<th>Novelty (N)</th>
<th>Claims</th>
<th>YES/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1-9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None</td>
<td>NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Inventive step (IS)</th>
<th>Claims</th>
<th>YES/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>None</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-9</td>
<td>NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Industrial applicability (IA)</th>
<th>Claims</th>
<th>YES/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1-9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None</td>
<td>NO</td>
</tr>
</tbody>
</table>

2. Citations and explanations:

[1] Reference is made to the following document:


[4] D1 discloses a process for preparing sodium cyanate, and the process comprises the steps of: adding urea and sodium carbonate into a grinder mixer, and mixing them for 5-10min; adding the resulting mixture into a cast iron reactor; and heating the reactor to obtain sodium cyanate (page 380, lines 9-14). D1 further discloses that sodium cyanate can be decomposed to sodium cyanide in the presence of catalyst at a temperature of 700°C (page 380, lines 2-4).

[6] D1 is considered to be the closest prior art

[8] Novelty:

[9] Obviously, D1 discloses first- and second-order reactions. D1 does not disclose the steps d) to h) of claim 1. Therefore, claims 1-9 are novel under PCT Article 33(2).

[11] Inventive Step:

[12] Claim 1 differs from D1 in that steps d) to h) of claim 1 are not disclosed. The technical problem solved by claim 1 is to atomize and purify sodium cyanide. The means, such as centrifugal atomization, agitation, dissolution, precipitating, filtering, vacuum distillation, centrifugal separating and drying, are common in the art, thus it is easy for the skilled one in the art to carry out above common means to obtain atomized and purified sodium cyanide. Therefore, claim 1 is obvious and lacks an inventive step under PCT Article 33(3).

[13] D1 actually discloses iron as a catalyst and the decomposition temperature of sodium cyanate. It is easy for the skilled one in the art to transform sodium cyanate into sodium cyanide by deoxidizing the first-order reaction product. Other technical features in claims 2-9, which are not disclosed in D1, are common in the art, and can be easily determined by the skilled one in the art. Combining with the comment on claim 1, claims 2-9 are obvious and lack an inventive step under PCT Article 33(3).

[15] Industrial Applicability:

[16] The subject matter of claims 1 to 9 is industrially applicable, and meets PCT Article 33(4).