A potash-extraction system and method for extracting potash from a brine containing potash without the use of water-consuming evaporation ponds or additional chemicals is disclosed. The potash processing system uses a mechanical-vapor recompression (MVR) cycle to separate salt and then potash from a sylvite brine containing salt and potash. In embodiments, the latent heat recovered from condensing vapor may be used to boil the brine to precipitate some salt and remove some water (in the form of water vapor) from the brine. The remaining potash-concentrated brine may then be cooled to precipitate potash from the solution. The precipitated potash may then be further processed for final use.
### A. **CLASSIFICATION OF SUBJECT MATTER**

**IPC(8):** C22B 26/10; C01D 3/04; B01D 1/24 (2013.01)

**USPC:** 423/499.1, 499.3, 197

According to International Patent Classification (IPC) or to both national classification and IPC

### B. **FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC(8): C22B 26/10; C01D 3/04; B01D 1/24 (2013.01)

USPC: 423/499.1, 499.3, 197

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)


### C. **DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
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<tr>
<td>Y</td>
<td>US 3402025 A (GARRETT, DE et al.) 17 September 1968; figure 1; column 2, lines 24-26; column 3, lines 6-12; column 3, lines 13-17; column 4, lines 18-28; column 5, lines 10-13; column 5, lines 29-36; column 5, lines 40-43; column 5, lines 61-64; column 5, lines 73-75</td>
<td>1-15, 17-18, 20</td>
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<td>Y</td>
<td>US 20110123420 A1 (PHINNEY, R) 26 May 2011; figures 5 and 7; paragraphs [0002], [0022], [0023], [0050], [0051]</td>
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<td>Y</td>
<td>US 2331890 A (CROSS, R) 19 October 1943; entire document</td>
<td>2-4, 11-13</td>
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<td>Y</td>
<td>US 2013/0149231 A1 (FARIA, F&amp;M et al.) 13 June 2013; figure 1; paragraphs [0017], [0045], [0046], [0047], [0050], [0051], [0052]</td>
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<td>Y</td>
<td>US 2013/0186741 A1 (BATTY, J et al.) 25 July 2013; abstract; figure 1; paragraphs [0043], [0086], [0115], [0231]</td>
<td>7, 18, 20</td>
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<td>A</td>
<td>US 2788257 A (DUKE, JB) 09 April 1957; entire document</td>
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<td>A</td>
<td>US 2665124 A (CROSS, JR, WM) 05 January 1954; entire document</td>
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<td>A</td>
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<td>A</td>
<td>US 4210421 A (DAHMS, JB) 01 July 1980; entire document</td>
<td>1-20</td>
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Further documents are listed in the continuation of Box C.

- *Special categories of cited documents:*
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- **"R"** document member of the same patent family

**Date of the actual completion of the international search:** 23 December 2013 (23.12.2013)

**Date of mailing of the international search report:** 10 January 2014 (10 JAN 2014)

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