least one selected from among iron, copper, lead, zinc, manganese, calcium, cerium, yttrium, and lanthanum compounds) is dissolved in an acid, followed by addition of alkali hydroxide to adjust the resulting solution to a pH of 1 to 10, thereby preparing a high-concentration lithium solution with a metal and phosphorus removed therefrom, and then a carbonate is added thereto, thereby producing lithium carbonate. However, this method requires increased consumption of the acid to dissolve both lithium phosphate and the metal compound. In addition, since the pH of the reaction solution is limited to a range of 1 to 10 upon adding the alkali to induce precipitation of metal ions present in the acidic solution in which lithium phosphate is dissolved, there is a possibility that heavy metal ions are not completely removed. Further, since pH adjustment is performed through addition of the alkali after dissolving the lithium phosphate-metal compound slurry in the acid, the production process is complicated and requires increased consumption of raw and supplementary materials, causing reduction in economic feasibility (see Japanese Patent Registration No. JP5632169B2 and Japanese Patent Registration NO. JP5528153B2).

[12] As described above, these conventional lithium carbonate production methods have problems of low economic feasibility due to low lithium recovery rate, high energy and investment costs, excessive raw and supplementary material costs, and a complicated production process. Therefore, there is an urgent need for a technology capable of economically producing lithium carbonate using lithium phosphate.

[13]

【Disclosure】

【Technical Problem】

[14] It is one object of the present disclosure to provide a lithium extraction method that can provide a high lithium recovery rate.

[15] It is another object of the present disclosure to provide a lithium extraction method that can economically produce a lithium compound from lithium phosphate through reduction in energy consumption, raw and supplementary material cost, equipment investment cost, and process complexity.

[16]

【Technical Solution】

[17] In accordance with one aspect of the present disclosure, there is provided a lithium extraction method comprising the steps of: preparing lithium phosphate containing impurities; dissolving the lithium phosphate and the impurities in an acid; and preparing a lithium-containing solution by adding an additive to a solution prepared by dissolving the lithium phosphate and the impurities in the acid, wherein the additive is a substance capable of simultaneously precipitating phosphate anions and the impurities, and the lithium-containing solution prepared through addition of the additive is basic.

[18] The impurities may include an alkaline earth metal.

[19] The alkaline earth metal may be beryllium (Be), magnesium (Mg), calcium (Ca), strontium (Sr), barium (Ba), radium (Ra), or a combination thereof.

[20] The solution prepared by dissolving the lithium phosphate and the impurities in the acid has a lithium concentration of 10 g/L to 35 g/L.

[21] In the step of dissolving the lithium phosphate and the impurities in the acid, the acid may be hydrochloric acid, hypochlorous acid, nitric acid, acetic acid, or a combination thereof.

[22] The solution prepared by dissolving the lithium phosphate and the impurities in the acid has a pH of -0.1 to 4.5.

[23] The additive may be an oxide or a hydroxide.

[24] The additive may be an oxide or hydroxide of a cation selected from among beryllium, magnesium, calcium, strontium, barium, radium, or a combination thereof.

[25] More specifically, the additive may be calcium hydroxide ($Ca(OH)_2$), magnesium hydroxide ($Mg(OH)_2$), or a combination thereof.

[26] The phosphate anions and the impurities may be precipitated in the form of a sparingly soluble precipitate from the solution prepared by dissolving the lithium phosphate and the impurities in the acid.

[27] The sparingly soluble precipitate may be hydroxyapatite ($Ca_5(PO_4)_3OH$), brushite ($CaHPO_4 \cdot 2H_2O$), an amorphous calcium-phosphorus compound, calcium hydroxide, newberyite ($MgHPO_4 \cdot 3H_2O$), magnesium phosphate ($Mg_3(PO_4)_2$), an amorphous magnesium-phosphorus compound, magnesium hydroxide, or a mixture

thereof.

[28] In the step of preparing the lithium-containing solution by adding the additive to the solution prepared by dissolving the lithium phosphate and the impurities in the acid, the prepared lithium-containing solution may have a pH of 9 or higher.

[29] In the step of preparing the lithium-containing solution by adding the additive to the solution prepared by dissolving the lithium phosphate and the impurities in the acid, the prepared lithium-containing solution may have a pH of 11 or higher.

[30] The lithium extraction method may further include: obtaining lithium carbonate by adding a carbonic acid feed material to the prepared lithium-containing solution.

[31] The carbonic acid feed material may be sodium carbonate (Na_2CO_3), potassium carbonate (K_2CO_3), ammonium carbonate ($(NH_4)_2CO_3$), sodium bicarbonate ($NaHCO_3$), potassium bicarbonate ($KHCO_3$), or a combination thereof.

[32] The lithium extraction method may further include washing and drying the prepared lithium carbonate.

[33]

【Advantageous Effects】

[34] Examples of the present disclosure provides a method of extracting lithium from lithium phosphate containing impurities (more specifically, an alkaline earth metal), wherein the method can economically produce a lithium compound (for example, lithium carbonate) through increase in lithium recovery rate and reduction in energy cost, raw and supplementary material cost, and equipment investment cost.

[35]

【Description of Drawings】

[36] FIG. 1 and Table 1 show the pH and lithium concentration of reaction filtrates prepared by mixing 10 g of magnesium-containing lithium phosphate with 0.1 L of aqueous hydrochloric acid solutions having different acidities at room temperature, followed by stirring for 60 minutes and filtration, the reaction filtrates