[16]

【Technical Solution】

[16a] In one aspect, there is provided a lithium extraction method comprising the steps of: providing lithium phosphate containing impurities; dissolving the lithium phosphate and the impurities in an aqueous acid solution; and preparing a lithium-containing solution by adding an additive to a solution prepared by dissolving the lithium phosphate and the impurities in the aqueous acid solution, 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, wherein the impurities comprise an alkaline earth metal.

[17] In accordance with one example 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

【CLAIMS】

【Claim 1】

A lithium extraction method comprising the steps of:

providing lithium phosphate containing impurities;

dissolving the lithium phosphate and the impurities in an aqueous acid solution; and

preparing a lithium-containing solution by adding an additive to a solution prepared by dissolving the lithium phosphate and the impurities in the aqueous acid solution,

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, wherein the impurities comprise an alkaline earth metal.

【Claim 2】

The lithium extraction method according to claim 1, wherein the alkaline earth metal is beryllium (Be), magnesium (Mg), calcium (Ca), strontium (Sr), barium (Ba), radium (Ra), or a combination thereof.

【Claim 3】

The lithium extraction method according to claim 1, wherein the solution prepared by dissolving the lithium phosphate and the impurities in the aqueous acid solution has a lithium concentration of 10 g/L to 35 g/L.

【Claim 4】

The lithium extraction method according to claim 1, wherein, in the step of dissolving the lithium phosphate and the impurities in the aqueous acid solution, the acid is hydrochloric acid, hypochlorous acid, nitric acid, acetic acid, or a combination thereof.

【Claim 5】

The lithium extraction method according to claim 1, wherein the solution prepared by dissolving the lithium phosphate and the impurities in the aqueous acid solution has a pH of -0.1 to 4.5.

【Claim 6】

The lithium extraction method according to claim 1, wherein the additive is an oxide or a hydroxide.

【Claim 7】

The lithium extraction method according to claim 6, wherein the additive is an oxide or hydroxide of a cation selected from among beryllium, magnesium, calcium, strontium, barium, radium, or a combination thereof.

【Claim 8】

The lithium extraction according to claim 1, wherein, 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 aqueous acid solution, the prepared lithium-containing solution has a pH of 9 or higher.

【Claim 9】

The lithium extraction method according to claim 1, wherein, 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 aqueous acid solution, the prepared lithium-containing solution has a pH of 11 or higher.

【Claim 10】

The lithium extraction method according to claim 1, further comprising:

obtaining lithium carbonate by adding a carbonic acid feed material to the

prepared lithium-containing solution.

【Claim 11】

The lithium extraction method according to claim 10, wherein the carbonic acid feed material is 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.