Claims

[Claim 1] A method of manufacturing a cement composition using cement, aggregate, and water, comprising:

a cement slurry preparation step of mixing part of the cement and part of the water to obtain a cement slurry having a water to cement ratio of 250% or more;

a carbonation step of bringing the cement slurry into contact with a carbon dioxide gas to obtain a carbonated slurry;

a concentration step of partially separating the water from the carbonated slurry to obtain a concentrated slurry having a liquid to solid ratio of from 80% to 400%;

an additional cement supply step of mixing the concentrated slurry and a remaining part of the cement to obtain a highly concentrated cement-containing composition; and

an additional water supply step of mixing the highly concentrated cement-containing composition and a remaining part of the water to obtain the cement composition,

wherein, in a total amount of the cement, a ratio of an amount of the part of the cement to be used in the cement slurry preparation step is from 1 mass% to 50 mass%, and a ratio of an amount of the remaining part of the cement to be used in the additional cement supply step is from 50 mass% to 99 mass%,

wherein the aggregate is supplied in any one or both of the additional cement supply step and the additional water supply step,

wherein, in a total amount of the water included in the cement composition, a ratio of an amount of the water in the concentrated slurry obtained in the concentration step is from 50 mass%, and a ratio of an amount of the remaining part of the water to be used in the additional water supply step is from 1 mass% to 50 mass%,

wherein a difference (X-Y) between the water to cement ratio(X)of the cement slurry obtained in the cement slurry preparation step and the liquid to solid ratio (Y) of the concentrated slurry obtained in the concentration step is 50% or more.

[Claim 2] The method of manufacturing a cement composition according to claim 1, wherein, in the carbonation step, the carbon dioxide gas is supplied as a gas containing 5 vol% or more of the carbon dioxide gas.

[Claim 3] The method of manufacturing a cement composition according to claim 1, wherein, in the carbonation step, the carbon dioxide gas is supplied until a pH of the carbonated slurry falls within a range of from 5.0 to 11.5.

[Claim 4] The method of manufacturing a cement composition according to claim 1,

wherein the cement composition comprises a cement admixture, and

wherein the cement admixture is supplied in the additional water supply step.

[Claim 5] The method of manufacturing a cement composition according to claim 4, wherein the cement admixture comprises one or more kinds of cement dispersing agents selected from the group consisting of: a water reducing agent; an air entraining water reducing agent; a high range water reducing agent; and an air entraining and high range water reducing agent, and an air entraining agent.

[Claim 6] The method of manufacturing a cement composition according to any one of claims 1 to 5,

wherein the aggregate comprises fine aggregate and coarse aggregate, and

wherein a liquid to solid ratio of the cement composition is from 30% to 65%.