CLAIMS:

1. A slurry quick-setting admixture which comprises water and a powder quick-setting admixture comprising an alkaline earth metal carbonate, a water-soluble acidic substance, calcium aluminate and an alkali metal sulfate.

2. The slurry quick-setting admixture according to Claim 1, which further contains calcium sulfate.

3. The slurry quick-setting admixture according to Claim 1 or 2, which further contains calcium hydroxide and/or aluminum hydroxide.

4. The slurry quick-setting admixture according to any one of Claims 1 to 3, which further contains a retarder.

5. A quick-setting cement concrete comprising the slurry quick-setting admixture as defined in any one of Claims 1 to 4, and cement concrete.

6. A spraying method which comprises mixing water and a powder quick-setting admixture comprising an alkaline earth metal carbonate, a water-soluble acidic substance, calcium aluminate and an alkali metal sulfate, to form a slurry quick-setting admixture, mixing this slurry quick-setting admixture with cement concrete to form a quick-setting cement concrete, and spraying this quick-setting cement concrete.

7. A spraying method which comprises joining and mixing, in a slurrying nozzle, water transported in a water supply line and a powder quick-setting admixture transported in a powder quick-setting admixture supply

line and comprising an alkaline earth metal carbonate, a water-soluble acidic substance, calcium aluminate and an alkali metal sulfate, to form a slurry quick-setting admixture, introducing this slurry quick-setting admixture via a slurry quick-setting admixture inlet port to a showering tube to mix it with cement concrete via slurry quick-setting admixture-adding holes to form a quick-setting cement concrete, and spraying this quick-setting cement concrete.

8. The spraying method according to Claim 7, wherein the showering tube has a double structure composed of an outer tube and an inner tube, and the inner tube has the slurry quick-setting admixture-adding holes.

9. The spraying method according to any one of Claims 6 to 8, wherein the powder quick-setting admixture contains calcium sulfate.

10. The spraying method according to any one of Claims 6 to 9, wherein the powder quick-setting admixture contains calcium hydroxide and/or aluminum hydroxide.

11. The spraying method according to any one of Claims 6 to 10, wherein the powder quick-setting admixture contains a retarder.

12. A quick-setting admixture for spraying which comprises a liquid quick-setting admixture, and a powder admixture comprising a blowing agent and calcium aluminate.

13. The quick-setting admixture for spraying according

to Claim 12, wherein the blowing agent is an alkaline earth metal carbonate.

14. The quick-setting admixture for spraying according to Claim 12 or 13, wherein the powder admixture further contains calcium sulfate.

15. The quick-setting admixture for spraying according to any one of Claims 12 to 14, wherein the powder admixture further contains an alkali metal sulfate.

16. The quick-setting admixture for spraying according to any one of Claims 12 to 15, wherein the liquid quick-setting admixture further contains an alkali metal element.

17. The quick-setting admixture for spraying according to any one of Claims 12 to 16, wherein the liquid quick-setting admixture contains a compound having a fluorine element.

18. The quick-setting admixture for spraying according to any one of Claims 12 to 17, which comprises, in 100 parts of the powder admixture, from 2 to 30 parts of an alkaline earth metal carbonate, from 30 to 70 parts of calcium aluminate, from 2 to 50 parts of an alkali metal sulfate and from 5 to 40 parts of calcium sulfate.

19. The quick-setting admixture for spraying according to any one of Claims 12 to 18, wherein the ratio of the liquid quick-setting admixture to the powder admixture is from 95:5 to 30:70 by mass ratio.

20. The quick-setting admixture for spraying according

to any one of Claims 12 to 19, wherein the liquid quick-setting admixture and the powder admixture are mixed in a slurry form.

21. A spraying material which comprises cement, an aggregate and the quick-setting admixture for spraying as defined in any one of Claims 12 to 20.

22. The spraying material according to Claim 21, wherein the amount of the quick-setting admixture for spraying comprising the liquid quick-setting admixture and the powder admixture, is from 5 to 25 parts, per 100 parts of the cement.

23. A spraying method which comprises using the spraying material as defined in Claim 21 or 22.

Claims

1. A slurry quick-setting admixture comprising water and a powder quick-setting admixture wherein said powder quick-setting admixture comprises 2 to 30 parts of an alkaline earth metal carbonate, a water-soluble acidic substance selected from the group consisting of aluminum sulfate, oxalic acid, and a combination thereof, calcium aluminate and an alkali metal sulfate.

2. The slurry quick-setting admixture according to claim 1, comprising calcium sulfate.

3. The slurry quick-setting admixture according to claim 1, comprising at least one of calcium hydroxide and aluminum hydroxide.

4. The slurry quick-setting admixture according to claim 1, further comprising a retarder.

5. A quick-setting cement concrete comprising the slurry quick-setting admixture according to claim 1, and cement concrete.

6. The slurry quick-setting admixture according to claim 1, comprising 3 to 50 parts of the water-soluble acidic substance, 20 to 70 parts of calcium aluminate and 2 to 30 parts of alkali metal sulfate, based on 100 parts of the admixture.

7. The slurry quick-setting admixture according to claim 6, comprising 5 to 20 parts of the alkaline earth metal carbonate, 5 to 40 parts of the water-soluble acidic substance, 35 to 60 parts of the calcium aluminate and 5 to 20 parts of the alkali metal sulfate, based on 100 parts of the admixture.

8. A spraying method comprising:

mixing water and a powder quick-setting admixture comprising 2 to 30 parts of an alkaline earth metal carbonate, a water-soluble acidic substance selected from the group

consisting of aluminum sulfate, oxalic acid, and a combination thereof, calcium aluminate and an alkali metal sulfate;

forming a slurry quick-setting admixture;

mixing said a slurry quick-setting admixture with cement concrete;

forming a quick-setting cement concrete; and

spraying said a quick-setting cement concrete.

9. A spraying method comprising:

joining and mixing, in a slurrying nozzle, water transported in a water supply line and a powder quick-setting admixture transported in a powder quick-setting admixture supply line wherein said powder quick-setting admixture comprises 2 to 30 parts of an alkaline earth metal carbonate, a water-soluble acidic substance selected from the group consisting of aluminum sulfate, oxalic acid, and a combination thereof, calcium aluminate and an alkali metal sulfate;

forming a slurry quick-setting admixture;

introducing said a slurry quick-setting admixture via a slurry quick-setting admixture inlet port to a showering tube;

mixing said a slurry quick-setting admixture with cement concrete via slurry quick-setting admixture-adding holes;

forming a quick-setting cement concrete; and

spraying said a quick-setting cement concrete.

10. The spraying method according to claim **9**, wherein the showering tube has a double structure comprising an outer tube and an inner tube wherein the inner tube has the slurry quick-setting admixture-adding holes.

11. The spraying method according to claim **9**, wherein the powder quick-setting admixture comprises calcium sulfate.

12. The spraying method according to claim **9**, wherein the powder quick-setting admixture comprises at least one of calcium hydroxide and aluminum hydroxide.

13. The spraying method according to claim **9**, wherein the powder quick-setting admixture comprises a retarder.

14. A quick-setting admixture suitable for spraying, comprising a liquid quick-setting admixture that comprises aluminum sulfate, and a powder admixture comprising calcium sulfate, an alkaline metal sulfate, an alkali metal element, 2 to 50 parts of an alkaline earth metal carbonate and calcium aluminate.

15. The quick-setting admixture for spraying according to claim **14**, wherein the liquid quick-setting admixture comprises a compound having a fluorine element.

16. The quick-setting admixture for spraying according to claim **14**, comprising, in 100 parts of the powder admixture, from 5 to 30 parts of the alkaline earth metal carbonate, from 30 to 70 parts of calcium aluminate, from 2 to 50 parts of the alkali metal sulfate and from 5 to 40 parts of calcium sulfate.

17. The quick-setting admixture for spraying according to claim **14**, wherein the ratio of the liquid quick-setting admixture to the powder admixture is from 95:5 to 30:70 by mass ratio.

18. The quick-setting admixture for spraying according to claim **14**, wherein the liquid quick-setting admixture and the powder admixture are mixed in a slurry form.

19. The quick-setting admixture for spraying according to claim **14**, wherein the quick-setting admixture has a pH of from 3 to 9 upon expiration of one minute after mixing the liquid quick-setting admixture and the powder admixture.

20. A spraying material comprising cement, an aggregate and the quick-setting admixture for spraying according to claim **14**.

21. The spraying material according to claim **20**, wherein the amount of the quick-setting admixture for spraying comprising the liquid quick-setting admixture and the powder admixture, is from 5 to 25 parts, per 100 parts of the cement.

22. A spraying method, comprising spraying the spraying material according to claim **20**.