CLAIMS

[Claim 1]

A hardening initiator for a ready-mixed shipping type rapid-hardening concrete, to be added to a composition containing a cement, a rapid hardener, and a retarder, the hardening initiator providing a hardening initiator-containing composition obtained after 30 minutes from addition of the hardening initiator to the composition under condition of 5°C, a liquid phase obtained through solid-liquid separation of the hardening initiator-containing composition having an aluminum ion concentration ($X_{5°C}$) that is 1.1 times or more an aluminum ion concentration ($Y_{5°C}$) of a liquid phase obtained through solid-liquid separation of a hardening initiator-non-containing composition obtained by not adding the hardening initiator to the composition under condition of 5°C,

wherein the hardening initiator comprises a calcium aluminate based compound in the amount of 70% or more by mass, or a calcium aluminate based compound and gypsum, wherein the gypsum is used in an amount of from 10 to 200 parts by mass per 100 parts by mass of the calcium aluminate based compound,

wherein the hardening initiator providing a hardening initiator-containing composition obtained after 30 minutes from addition of the hardening initiator to the composition under condition of 20°C, a liquid phase obtained through solid-liquid separation of the hardening initiator-containing composition having an aluminum ion concentration ($X_{20°C}$), wherein the value of $X_{5°C}/X_{20°C}$ is 0.65 or more.

[Claim 2]

The hardening initiator for a ready-mixed shipping type rapid-hardening concrete according to claim 1, wherein the calcium aluminate based compound contains CaO in a range of from 30 to 60% by mass, Al_2O_3 in a range of from 30 to 60% by mass, and SiO_2 in a range of from 1 to 18% by mass.

[Claim 3]

The hardening initiator for a ready-mixed shipping type rapid-hardening concrete according to claim 1 or 2, wherein the calcium aluminate based compound has a degree of amorphousness of 70% or more.

[Claim 4]

A two-component type ready-mixed shipping type rapid-hardening concrete comprising: a material A containing a cement, a rapid hardener, and a

retarder; and a material B containing the hardening initiator for a ready-mixed shipping type rapid-hardening concrete according to any one of claims 1 to 3.

[Claim 5]

A ready-mixed shipping type rapid-hardening concrete composition comprising a material A containing a cement, a rapid hardener, and a retarder, having added thereto and mixed therewith a material B containing the hardening initiator for a ready-mixed shipping type rapid-hardening concrete according to any one of claims 1 to 3.

[Claim 6]

The ready-mixed shipping type rapid-hardening concrete composition according to claim 5, wherein the hardening initiator contains a calcium aluminate based compound and a gypsum compound.

[Claim 7]

The ready-mixed shipping type rapid-hardening concrete composition according to claim 6, wherein the calcium aluminate based compound contains a CaO-Al_2O_3-SiO_2 based compound, and the CaO-Al_2O_3-SiO_2 based compound has a degree of amorphousness of 70% or more and contains SiO_2 in a range of from 1 to 18% by mass.

[Claim 8]

The ready-mixed shipping type rapid-hardening concrete composition according to any one of claims 5 to 7, wherein the retarder contains an oxycarboxylic acid, or a mixture of a carbonate salt of an alkali metal except for lithium and an oxycarboxylic acid.

[Claim 9]

The ready-mixed shipping type rapid-hardening concrete composition according to any one of claims 5 to 8, wherein the composition has a content of the hardening initiator for a ready-mixed shipping type rapid-hardening concrete of from 0.5 to 7 parts by mass per 100 parts by mass in total of the cement and the rapid hardener.

[Claim 10]

A method for preparing a ready-mixed shipping type rapid-hardening concrete, comprising in this order: kneading at least a cement, a rapid hardener, and a retarder with kneading water in a kneading vessel; and further mixing the hardening initiator for a ready-mixed shipping type rapid-hardening concrete according to any one of claims 1 to 3.

[Claim 11]

The method for preparing a ready-mixed shipping type rapid-hardening concrete according to claim 10, wherein a base concrete containing at least the cement, the rapid hardener, the retarder, the aggregate, and the kneading water has a volume of 40% or more of an inner capacity of the kneading vessel.

[Claim 12]

The method for preparing a ready-mixed shipping type rapid-hardening concrete according to claim 10 or 11, wherein a kind and an amount of the hardening initiator for a ready-mixed shipping type rapid-hardening concrete are determined to ensure a usable time of 15 minutes or more after mixing the hardening initiator for a ready-mixed shipping type rapid-hardening concrete.

[Claim 13]

The method for preparing a ready-mixed shipping type rapid-hardening concrete according to any one of claims 10 to 12, wherein the retarder is used in an amount of from 0.3 to 5 parts by mass per 100 parts by mass in total of the cement and the rapid hardener.