CLAIMS

[Claim 1] A molten salt circulation apparatus comprising:

a tank for reserving a molten salt composed of at least one of sodium nitrite, sodium nitrate, and potassium nitrate;

a heater for heating the molten salt in the tank;

a pump for sending out the molten salt from the tank;

a circulation path for circulating the molten salt sent out from the tank and returning the molten salt to the tank; and

a water supply source for supplying water into the tank,

wherein the amount of water to be added to the molten salt is 6% by weight to 50% by weight of the weight of the molten salt, and the tank has capacity for reserving the molten salt and the water added to the molten salt.

[Claim 2] The molten salt circulation apparatus according to claim 1, comprising:

a gas supply source for supplying an air shutting gas composed of an inert gas or steam into the tank.

[Claim 3] The molten salt circulation apparatus according to claim 1 or 2, wherein

a pipe of the circulation path is inclined toward the tank such that the molten salt in the circulation path returns to the tank when the pump is stopped.

[Claim 4] A molten salt circulation method using a circulation apparatus including: a tank for reserving a molten salt composed of at least one of sodium nitrite, sodium nitrate,

and potassium nitrate; a heater for heating the molten salt in the tank; a pump for sending out the molten salt from the tank; a circulation path for circulating the molten salt sent out from the tank and returning the molten salt to the tank; and a water supply source for supplying water into the tank, wherein the amount of water to be added to the molten salt is 6% by weight to 50% by weight of the weight of the molten salt, and the tank has capacity for reserving the molten salt and the water added to the molten salt,

the molten salt circulation method comprising:

diluting the molten salt with water supplied from the water supply source to lower the freezing point of the molten salt;

heating the molten salt diluted with the water by using the heater to maintain a liquid state of the molten salt; and

circulating the molten salt through the circulation path by driving the pump.

[Claim 5] The molten salt circulation method according to claim 4, wherein

the circulation apparatus includes a gas supply source for supplying an air shutting gas composed of an inert gas or steam into the tank,

the molten salt circulation method comprising:

supplying the air shutting gas from the gas supply source into the tank when the pump is driven.

[Claim 6] The molten salt circulation method according to claim 4 or 5, wherein

in the circulation apparatus, a pipe of the circulation

path is inclined toward the tank such that the molten salt in the circulation path returns to the tank when the pump is stopped,

the molten salt circulation method comprising:

recovering the molten salt into the tank when the pump is stopped.

[Claim 7] The molten salt circulation method according to claim 4 or 5, comprising:

when operation is stopped, maintaining the driving of the pump, and when a temperature of the molten salt has been decreased to a threshold set in advance, supplying water from the water supply source into the tank.

[Claim 8] The molten salt circulation method according to claim 4 or 5, comprising:

measuring a concentration of sodium oxide in the molten salt periodically; and

when the concentration of sodium oxide in the molten salt has reached to a threshold set in advance, adding nitric acid to the molten salt.