[Problems to be solved by the Invention]

[0007]

Unfortunately, when the flow rate of supply water is decreased during operation of the electrodeionization system, there is a problem in that scale may occur due to excessive concentration of the concentrated water in each of the plurality of electrodeionization devices installed.

[0008]

Embodiments of the present invention provide an electrodeionization system that reduces the production cost while suppressing the occurrence of scale due to a decrease in the flow rate of supply water to each electrodeionization device.

[Means for solving the Problems]

[0009]

According to a first aspect of the present invention, there is provided an electrodeionization system including a plurality of electrodeionization devices installed in parallel, the electrodeionization system including: a supply water flow rate varying means that varies a flow rate of supply water to the plurality of electrodeionization devices; a concentrated water flow rate adjusting means that adjusts, for each electrodeionization device, a flow rate of concentrated water discharged from each of the plurality of electrodeionization devices; and a concentrated water flow rate maintaining means that maintains the flow rate of the concentrated water discharged from each of the plurality of electrodeionization devices at a certain level or higher using a first control valve and a second control valve, wherein the first control valve is provided only in a main flow path in which a

plurality of sub-flow paths are integrated while the second control valve is provided only in a main path in which a plurality of sub-paths are integrated, wherein desalted water produced in each of the plurality of electrodeionization devices flows through each of the plurality of sub-flow paths while concentrated water discharged from each of the plurality of electrodeionization devices flows through each of the plurality of sub-paths.

[0010]

According to the above aspect, even when the flow rate of supply water to the plurality of electrodeionization devices (also simply referred to as the flow rate of supply water) is varied, the flow rate of concentrated water discharged from each electrodeionization device (also simply referred to as the flow rate of concentrated water) can be kept constant thereby to suppress the occurrence of scale. Moreover, even when the concentrated water flow rate maintaining means is not provided in each of the sub-flow paths or sub-paths, the flow rate of concentrated water can be kept constant, provided that the concentrated water flow rate maintaining means is provided only in each of the main flow path for desalted water and the main path for concentrated water, and it is therefore possible to reduce the production cost of the electrodeionization system.

[0011]

In an embodiment of the above aspect, the supply water flow rate varying means may increase or decrease the flow rate of supply water within a range of 30% to 100%.

[0012]

Claims

1. An electrodeionization system comprising a plurality of electrodeionization devices installed in parallel, the electrodeionization system comprising:

a supply water flow rate varying means that varies a flow rate of supply water to the plurality of electrodeionization devices;

a concentrated water flow rate adjusting means that adjusts, for each electrodeionization device, a flow rate of concentrated water discharged from each of the plurality of electrodeionization devices; and

a concentrated water flow rate maintaining means that maintains the flow rate of the concentrated water discharged from each of the plurality of electrodeionization devices at a certain level or higher using a first control valve and a second control valve, wherein the first control valve is provided only in a main flow path in which a plurality of sub-flow paths are integrated while the second control valve is provided only in a main path in which a plurality of sub-paths are integrated,

wherein desalted water produced in each of the plurality of electrodeionization devices flows through each of the plurality of sub-flow paths while concentrated water discharged from each of the plurality of electrodeionization devices flows through each of the plurality of sub-paths.

2. The electrodeionization system according to claim 1, wherein the supply water flow rate varying means increases or decreases the flow rate of supply water within a range of 30% to 100%.

3. The electrodeionization system according to claim 1 or 2, wherein the concentrated water flow rate adjusting means is a manual valve provided in each of the sub-paths.

4. A control method for an electrodeionization system comprising a plurality of electrodeionization devices installed in parallel, the control method comprising:

a supply water flow rate varying step of varying a flow rate of supply water to the plurality of electrodeionization devices;

a concentrated water flow rate adjusting step of adjusting, for each electrodeionization device, a flow rate of concentrated water discharged from each of the plurality of electrodeionization devices; and

a concentrated water flow rate maintaining step of maintaining the flow rate of the concentrated water discharged from each of the plurality of electrodeionization devices at a certain level or higher using a first control valve and a second control valve, wherein the first control valve is provided only in a main flow path in which a plurality of sub-flow paths are integrated while the second control valve is provided only in a main path in which a plurality of sub-paths are integrated, wherein desalted water produced in each of the plurality of electrodeionization devices flows through each of the plurality of sub-flow paths while concentrated water discharged from each of the plurality of electrodeionization devices flows through each of the plurality of sub-paths.

5. The control method for an electrodeionization system according to claim 4, wherein the supply water flow rate varying step includes increasing or decreasing the flow rate of supply water within a range of 30% to 100%.