[Description]

[Title of the Invention] AMMONIA TREATMENT SYSTEM

[Technical Field]

[0001]

The present invention relates to an ammonia treatment system, and more particularly, to an ammonia treatment system that electrolyzes ammonia contained in blow off water serving as drainage from a boiler facility.

This application claims priority to and the benefit of Japanese Patent Application Nos. 2012-119933 filed on May 25, 2012, and 2013-010251 filed on January 23, 2013, the contents of which are incorporated herein by reference.

[Background Art]

[0002]

For instance, hydrazine used for removing oxygen serving as a cause of corrosion in a thermal power plant is considered to be "a chemical substance having Mutagenicity." Therefore, adoption of water treatment using a more safe oxygen oxygen scavenger or without use of the oxygen scavenger has been proceeding recently.

As the oxygen scavenger not using hydrazine, ammonia having a high hydrogen ionic index (pH) (for example, pH 7 to pH 9) is known in the art. However, it is presumed that using ammonia as the oxygen scavenger may increase the concentration of ammonia in the drainage from a plant in the future (for example, see Non-Patent Document 1). Meanwhile, a decrease of nitrogen is also required according to the regulation of emissions and a quick response will be required.

[0003]

Patent Document 1 discloses an ammonia treatment system that electrolyzes the drainage from a power plant so as to decompose ammonia, wherein an end point of electrolysis is determined from the concentration of residual chlorine.

An ammonia treatment system using chemicals such as sodium hyperchlorite to decompose ammonia through chlorine treatment is also known in the related art.

[Prior Art Document]

[Claims]

[Claim 1]

An ammonia treatment system comprising:

a boiler facility configured to recover heat;

an ammonia inflow device configured to flow ammonia into a feed-water system in the boiler facility;

an ammonia concentration measuring unit configured to measure a concentration of ammonia contained in blow off water from the feed-water system or the boiler facility;

a flow rate measuring unit configured to measure an amount of the blow off water;

a circulation regulating tank which introduces an aqueous sodium chloride solution as a source of chloride ions;

an electrolysis tank which introduces treated water from the circulation regulating tank and which is configured to electrolyze the treated water;

a circulation pump which feeds an electrolytic treatment solution to the circulation regulating tank, the electrolytic treatment solution treated in the circulation regulating tank;

a mixing tank configured to receive the blow off water, and receive the treated water from the electrolysis tank; and

a controller configured to control a current and processing time during the electrolysis,

wherein the circulation regulating tank includes:

a pH measuring unit which is configured to measure the pH of the treated water;

a temperature measuring unit which is configured to measure a temperature of the treated water; and

a chloride ion concentration measuring unit which is configured to measure a concentration of chloride ions contained in the treated water,

wherein the controller calculates a required amount of chlorine based on the concentration of ammonia and the amount of the blow off water, and controls a current level during electrolysis, and

wherein the ammonia treatment system further including:

a desalination device installed at a downstream side of the mixing tank, and

a concentrated water recycling pipeline configured to feed a part of the concentrated water concentrated by the desalination device, as a source of chloride ions, into the circulation regulating tank.

[Claim 2]

The ammonia treatment system according to claim 5, further comprising a residual chlorine measuring unit configured to measure a concentration of residual chlorine contained in the treated water during electrolysis,

wherein the controller determines the end point of electrolysis based on the concentration of residual chlorine.

[Claim 3]

The ammonia treatment system according to claim 5 or 6,

wherein the controller controls an introduction amount of the aqueous sodium chloride solution so that the concentration of chloride ions becomes a predetermined level or more.