SUMMARY

Problems to be solved

[0006]

However, in conventional technologies, there has been desired further improvement in heavy metal treatment capability, particularly in the case of incinerated ash treatment, an improvement in elution reduction from incinerated ash, and in the case of wastewater treatment, an improvement in heavy metal recovering efficiency and floc formation capability.

[0007]

The present disclosure has been made in view of these circumstances, and intends to provide a novel heavy metal treatment agent having improved performance for treating elements of groups 6 to 16 of the periodic table or compounds thereof, including treatment of incinerated ash and wastewater, etc.; and a method for treating incinerated ash and wastewater using the heavy metal treatment agent.

Means to solve the problems

[0008]

In order to solve the above problems, the disclosure as set forth in the following will be disclosed.

[1] In an aspect, there is provided a heavy metal treatment agent comprising at least one dithiocarbamate of one or more amine compounds represented by any of formulae (I) to (III):

[Chemical formula 1]

[14] In another aspect, there is provided a method for treating incinerated ash containing any one or more elements of groups 6, 12 and 14 of the periodic table or compounds thereof, wherein the method comprises the step of adding the heavy metal treatment agent according to any one of [1] to [13] into the incinerated ash.

[15] The method for treating incinerated ash according to [14], wherein an eluate of the incinerated ash of the experiment as set forth in Japan Environment Agency Notification No. 13 has a pH of 11.5 or more.

[16] In another aspect, there is provided a method for treating wastewater containing any one or more elements of groups 6 to 16 of the periodic table or compounds thereof, wherein the method comprises the step of adding: the heavy metal treatment agent according to any one of [1] to [13]; and an iron-based inorganic flocculant and/or an aluminium-based inorganic flocculant into a subject water solution.

[17] In another aspect, there is provided a method for treating wastewater containing any one or more elements of groups 6 to 16 of the periodic table or compounds thereof, wherein the method comprises the step of adding: the heavy metal treatment agent according to any one of [1] to [13]; and a polymer flocculant into a subject water solution.

[18] In another aspect, there is provided a method for treating wastewater containing any one or more elements of groups 6 to 16 of the periodic table or compounds thereof, wherein the method comprises the step of adding: the heavy metal treatment agent according to any one of [1] to [13]; a polymer flocculant; and an iron-based inorganic flocculant and/or an aluminium-based inorganic flocculant into a subject water solution.

Effects

[0009]

The present disclosure provides a novel heavy metal treatment agent for treating, for example, incinerated ash and wastewater, and the agent has an improved capability of treating elements of groups 6 to 16 of the periodic table or compounds thereof, particularly in the case of incinerated ash treatment, the agent has an improved elution reduction property of reducing heavy metal elution from incinerated ash, and in the case of wastewater treatment, the agent has an improved heavy metal recovering efficiency and floc formation capability. Further, according to the method for treating incinerated ash containing any elements of groups 6 to 16 of the periodic table or compounds thereof, this novel heavy metal treatment agent may be used to provide a method for treating incinerated ash that provides an improved heavy metal elution reduction capability from the incinerated ash. According to the method for treating wastewater containing any elements of groups 6 to 16 of the periodic table or compounds thereof, this novel heavy metal treatment agent as well as a flocculant may be used to provide a method for treating wastewater that provides an improved heavy metal recovering efficiency and floc formation capability.

MODE FOR CARRYING OUT THE DISCLOSURE

[0010]

Specific examples of the present disclosure will be described hereunder. The heavy metal treatment agent of the present disclosure comprises at least one dithiocarbamate of one or more amine compounds represented by any of formulae (I) to (III). The expression "at least one dithiocarbamate of one or more amine compounds" as used herein refers to a dithiocarbamate that is made of at least one species of amine compounds as the ingredients. The dithiocarbamate is a compound in which a hydrogen atom bonded to a nitrogen atom of an amine compound of the ingredient is substituted by a dithioate.

[0011]