Summary

Technical Problem

[0006] Means of mixing the spent layered double hydroxide and the carbonic acid aqueous solution as described above can be carried out in a layered double hydroxide regeneration facility installed out of a waste incineration facility. This case, however, has a problem of high labor and cost burdens on transport of the spent layered double hydroxide between the waste incineration facility and the layered double hydroxide regeneration facility and of a regenerated layered double hydroxide, and on installation of another outside facility other than the waste incineration facility and the like.

Further, in the case where a regeneration facility of the spent layered double hydroxide is installed inside the waste incineration facility, a storage tank and a mixing tank of the carbonic acid aqueous solution, and the like need to be installed and connected, inevitably needing to make large the scale of the whole of the facilities.

[0007] The present disclosure has been made in order to solve the above technical problems, and has an object to provide a method for regenerating a carbonate-type layered double hydroxide, the method being capable of efficiently regenerating a spent anion-type Mg-Al LDH in an acidic exhaust gas treatment into a carbonate-type Mg-Al LDH, and provide an acidic exhaust gas treatment facility.

Solution to Problem

[0008] The present disclosure is based on the finding that by bringing a spent layered double hydroxide in an acidic exhaust gas treatment into contact with a gas containing water and a predetermined amount of carbon dioxide, particularly a treated gas from the acidic exhaust gas treatment, the spent layered double hydroxide can efficiently be regenerated into a carbonate-type layered double hydroxide.

[0008a] In one aspect, the present disclosure refers to a method for regenerating a carbonate-type layered double hydroxide, comprising bringing an anion-type Mg-Al layered double hydroxide converted from the carbonate-type layered double hydroxide in an acidic exhaust gas treatment using the carbonate-type Mg-Al layered double hydroxide into contact with a mixed gas at 70°C or higher

containing water and carbon dioxide at a concentration of 5% by volume or higher to exchange interlayer anions of the anion-type Mg-Al LDH for interlayer carbonate ions, wherein the acidic exhaust gas treatment is a treatment of an acidic exhaust gas generated in a combustion facility, and a treated gas from the treatment in which an acidic gas excluding carbon dioxide has been removed is used for the mixed gas.

[0008b] In another aspect, the present disclosure refers to an acidic exhaust gas treatment facility, comprising a facility for means (1) of carrying out an acidic exhaust gas treatment using a carbonate-type Mg-Al layered double hydroxide, and means (2) of carrying out regeneration of the carbonate-type Mg-Al layered double hydroxide by the regeneration method as disclosed herein.

[0009] That is, the present disclosure provides the following [1] to [4].

[1] A method for regenerating a carbonate-type layered double hydroxide, comprising bringing an anion-type Mg-Al layered double hydroxide formed in an acidic exhaust gas treatment using the carbonate-type Mg-Al layered double hydroxide into contact with a mixed gas at 70°C or higher containing water and

CLAIMS

[Claim 1]

A method for regenerating a carbonate-type layered double hydroxide, comprising bringing an anion-type Mg-Al layered double hydroxide converted from the carbonate-type layered double hydroxide in an acidic exhaust gas treatment using the carbonate-type Mg-Al layered double hydroxide into contact with a mixed gas at 70°C or higher containing water and carbon dioxide at a concentration of 5% by volume or higher to exchange interlayer anions of the anion-type Mg-Al LDH for interlayer carbonate ions, wherein

the acidic exhaust gas treatment is a treatment of an acidic exhaust gas generated in a combustion facility, and

a treated gas from the treatment in which an acidic gas excluding carbon dioxide has been removed is used for the mixed gas.

[Claim 2]

The method for regenerating a carbonate-type layered double hydroxide according to claim 1, wherein a moisture content of the mixed gas is 10% or larger.

[Claim 3]

An acidic exhaust gas treatment facility, comprising a facility for

means (1) of carrying out an acidic exhaust gas treatment using a carbonate-type Mg-Al layered double hydroxide, and

means (2) of carrying out regeneration of the carbonate-type Mg-Al layered double hydroxide by the regeneration method according to claim 1 or 2.