salt and an ammonium salt in an oxidizing atmosphere and at a temperature greater than or equal to 850°C, wherein the ammonium salt is selected among ammonium carbonate, ammonium chloride, ammonium sulfate, ammonium sulfide, and mixtures thereof, and wherein the powder composition comprises, relative to the total weight of the composition, at least 50% of alkaline earth metal salt, and the mass ratio between the ammonium salt and the alkaline earth metal salt is from 0.05 to 0.3.

[11] Advantageously, the method according to the present disclosure makes it possible to reduce the concentration of acid gases in combustion flue gas in an efficient manner.

[12] The method according to the present disclosure thus advantageously makes it possible to maintain the concentration of acid gases in combustion flue gas below the values set by regulatory standards even when peaks in the acid gas concentration appear in the combustion flue gas.

[13] The method according to the present disclosure is also more economical and safer than conventional methods for reducing the acid gas concentration in combustion flue gas, because:

- the cost of the powder composition is lower than that of the neutralizing reagents conventionally used, and
- an efficient reduction of the acid gas concentration in combustion flue gas allows significantly reducing the consumption of the neutralizing reagents conventionally used, and therefore reducing the costs and risks associated with said neutralizing reagents and reducing the costly maintenance shutdowns.

[14] A second aspect of the present disclosure is a powder composition comprising an alkaline earth metal salt and an ammonium salt comprising, relative to the total weight of the composition, at least 50% of alkaline earth metal salt, and the mass ratio between the ammonium salt and the alkaline earth metal salt is from

0.05 to 0.3, and wherein the ammonium salt is selected among ammonium carbonate, ammonium chloride, ammonium sulfate, ammonium sulfide, and mixtures thereof.

Brief description of drawings

Fig. 1

[15] [Fig. 1] is a diagram illustrating a combustion unit.

Detailed description of the invention

[16] According to a first object, the invention relates to a method for treating combustion flue gas comprising acid gases, said method comprising a contact step a) of placing said acid gases in contact with a powder composition comprising an alkaline earth metal salt and an ammonium salt in an oxidizing atmosphere and at

Claims

[Claim 1] Method for treating combustion flue gas comprising acid gases, said method comprising a contact step a) of placing said acid gases in contact with a powder composition comprising an alkaline earth metal salt and an ammonium salt in an oxidizing atmosphere and at a temperature greater than or equal to 850°C, wherein the ammonium salt is selected among ammonium carbonate, ammonium chloride, ammonium sulfate, ammonium sulfide, and mixtures thereof, and wherein the powder composition comprises, relative to the total weight of the composition, at least 50% of alkaline earth metal salt, and the mass ratio between the ammonium salt and the alkaline earth metal salt is from 0.05 to 0.3.

[Claim 2] Method according to claim 1, wherein the acid gases are selected among H_3PO_4, CO_2, NO_x, HCN, SO_2, H_2S, HF, F_2, HCl, Cl_2, HBr, Br_2, HI, I_2, and mixtures thereof.

[Claim 3] Method according to claim 1 or claim 2, wherein the alkaline earth metal salt comprises a cation selected among a magnesium cation, a calcium cation, and mixtures thereof.

[Claim 4] Method according to one of the preceding claims, wherein the ammonium salt is ~~selected among ammonium carbonate, ammonium chloride,~~ ammonium sulfate~~, ammonium sulfide, and mixtures thereof~~.

[Claim 5] Method according to one of the preceding claims, wherein the powder composition comprises calcium carbonate and ammonium sulfate.

[Claim 6] Method according to claim 5, wherein the calcium carbonate comes from chalk, limestone, lime, industrial waste, and mixtures thereof.

[Claim 7] Method according to claim 6, wherein the industrial waste is mineral sludge.

[Claim 8] Method according to claim 7, wherein the mineral sludge is decarbonation sludge, sludge from primary brine purification, and a mixture thereof.

~~**[Claim 9]** Method according to one of the preceding claims, wherein the powder composition comprises, relative to the total weight of the composition, at least 50% of alkaline earth metal salt, and the mass ratio between the ammonium salt and the alkaline earth metal salt is from 0.05 to 0.3.~~

~~[Claim 10]~~[Claim 9] Method according to one of the preceding claims, wherein the powder composition further comprises an additive, in particular an additive selected among a clay, a bromine salt, and mixtures thereof.

~~[Claim 11]~~[Claim 10] Method according to claim ~~10~~9, wherein the powder composition comprises a clay and, relative to the total weight of the composition, at least 50% of alkaline earth metal salt, the mass ratio between the ammonium salt and the alkaline earth metal salt is from 0.05 to 0.3, and the mass ratio between the clay and the alkaline earth metal salt is from 0.05 to 0.3.

~~[Claim 12]~~[Claim 11] Method according to one of the preceding claims, wherein the contact step a) is carried out in a combustion furnace (11) and/or in a post-combustion chamber (12) of a combustion unit (1).

~~[Claim 13]~~[Claim 12] Powder composition comprising an alkaline earth metal salt and an ammonium salt comprising, relative to the total weight of the composition, at least 50% of alkaline earth metal salt, and the mass ratio between the ammonium salt and the alkaline earth metal salt is from 0.05 to 0.3, and
wherein the ammonium salt is selected among ammonium carbonate, ammonium chloride, ammonium sulfate, ammonium sulfide, and mixtures thereof.

~~[Claim 14]~~[Claim 13] Powder composition according to claim ~~13~~12, wherein the alkaline earth metal salt comprises a cation selected among a magnesium cation, a calcium cation, and mixtures thereof.

~~[Claim 15]~~[Claim 14] Powder composition according to claim ~~13~~ 12 or claim ~~14~~13, wherein the ammonium salt is ~~selected among ammonium carbonate, ammonium chloride,~~ ammonium sulfate~~, ammonium sulfide, and mixtures thereof~~.

~~[Claim 16]~~[Claim 15] Powder composition according to any one of claims ~~13~~ 12 to ~~15~~14, comprising calcium carbonate and ammonium sulfate.

~~[Claim 17]~~[Claim 16] Powder composition according to claim ~~16~~15, wherein the calcium carbonate comes from chalk, limestone, lime, industrial waste, and mixtures thereof.

~~[Claim 18]~~[Claim 17] Powder composition according to claim ~~17~~16, wherein the industrial waste is mineral sludge.

~~[Claim 19]~~[Claim 18] Powder composition according to claim ~~18~~17, wherein the mineral sludge is decarbonation sludge, sludge from primary brine purification, and a mixture thereof.

~~[Claim 20] Powder composition according to any one of claims 13 to 19 comprising, relative to the total weight of the composition, at least 50% of alkaline earth metal salt, and the mass ratio between the ammonium salt and the alkaline earth metal salt is from 0.1 to 0.3.~~

~~[Claim 21]~~[Claim 19] Powder composition according to any one of claims ~~13~~ 12 to ~~20~~19, further comprising an additive, in particular an additive selected among a clay, a bromine salt, and mixtures thereof.

~~[Claim 22]~~[Claim 20] Powder composition according to claim ~~21~~19, comprising a clay and, relative to the total weight of the composition, at least 50% of alkaline earth metal salt, the mass ratio between the ammonium salt and the alkaline earth metal salt is from 0.1 to 0.3, and the mass ratio between the clay and the alkaline earth metal salt is from 0.1 to 0.3.