

The invention relates to a process for regulating the amount of treating agent for reducing the nitrogen oxide content of the exhaust gases from combustion processes, in which the amount is regulated in accordance with the nitrogen oxide content.

When treating exhaust gases from combustion processes in order to reduce the nitrogen oxide content, either ammonia is supplied into the exhaust gas stream in front of a reduction catalyst (SCR process) or ammonia or a substance forming ammonia or ammonium compounds under the influence of heat (e.g. urea, sal volatile or similar substances) is injected into the exhaust gas stream in the temperature range above 700°C (SNCR process). In both cases, ammonia not consumed in the nitrogen oxide reduction reaction can be discharged in the exhaust gases as what is referred to as ammonia slip. This leads to contamination both of the atmosphere and of the subsequent exhaust gas scrubbers if ammonia or ammonium compounds (ammonium chloride, ammonium sulphate, ammonium bisulphate) are discharged together with the dust from a filter plant or the waste water from a wet scrubber.

The aim of the invention is to propose a process for regulating the amount of treating agent, e.g. ammonia, for reducing the nitrogen oxide content in exhaust gases from combustion processes, by means of which not only the nitrogen oxide content, but also the content of unconsumed treating agent can be kept as low as possible.

This problem is solved according to the invention, departing from a process of the type specified at the outset, in that a treating agent slip desired value is used in addition to a predetermined nitrogen oxide content desired value and is

varied in accordance with the nitrogen oxide content value measured in the waste gas. The combination according to the invention of a nitrogen oxide content desired value and a treating agent slip desired value for regulating the amount of treating agent solves the problem set, i.e. reducing the nitrogen oxide content while at the same time keeping the slip of treating agent as low as possible.

Improved regulation accuracy is achieved according to a preferred embodiment of the process in that the rate of change of the nitrogen oxide content value measured is taken into account when varying the treating agent slip desired value.

E.g. ammonia can be used as the treating agent, the ammonia not consumed in the nitrogen oxide reduction escaping as ammonia slip.

The invention will now be described with reference to a diagrammatic view shown by way of example in the accompanying drawing.

As is clear from the drawing, in order to regulate the amount of treating agent in a combustion plant 1 consisting of a combustion chamber and a boiler, both the nitrogen oxide content 3 and the treating agent slip (ammonia slip) 4 in the exhaust gas 2 are measured, these values being measured at a point at which already treated exhaust gas, i.e. exhaust gas subjected to the treating agent, is situated. The value of the nitrogen oxide content 3 is fed to a control unit 5 as a controlled variable and the value of the treating slip 4 is fed to a control unit 6 as a controlled variable. The control unit 5 receives the nitrogen oxide content desired value 7 to be

maintained, while the treating agent slip desired value 8 to be maintained to is fed to the control unit 6. This treating agent slip desired value predetermined at the start of operation represents a basic setting, this basic setting then being varied during the treatment of the exhaust gas, as described hereinafter.

If treating agent 10 is then supplied to the exhaust gas by means of a conveyor means 9 in accordance with the nitrogen oxide content 3 measured, taking account of the predetermined nitrogen oxide content desired value 7, and if the measured slip value 4 of the treating agent increases, e.g. as a result of fluctuations in the combustion process, less treating agent must then be supplied to the exhaust gas. However, this would lead to an increase in the nitrogen oxide content. If the amount were then regulated only in accordance with the nitrogen oxide content, there would be no control over the slip of the treating agent.

According to the invention, the value 3 of the nitrogen oxide content measured in the exhaust gas is used to generate a controlled variable 11 in the control unit 5, resulting in a variation in the treating agent slip desired value in the control unit 6 and thus in a controlled variable 12. By means of this controlled variable 12, the control unit 6 influences the conveyor means 9 for the treating agent 10 and thus the amount of treating agent to be supplied to the exhaust gas.

Therefore, e.g. if the value 3 of the nitrogen oxide content exceeds the predetermined nitrogen oxide desired value 7 by a certain amount, the value 3 being used in practice as an average value over a specific period of time, e.g. one minute,

the treating agent slip desired value 8 in the control unit 6 is then increased by the controlled variable 11 originating from the control unit 5. This ensures that the amount of treating agent is not increased to the great extent that would be the case if the amount were to be influenced exclusively in accordance with the set value 3 of the nitrogen oxide content. Regulating the amount exclusively by the value 3 of the nitrogen oxide content would lead to too sharp an increase in the treating agent slip 4, thereby resulting in greater environmental pollution. The measure according to the invention reduces the tendency to increase the amount when the nitrogen oxide content is increased, thereby maintaining a certain balance between the nitrogen oxide content and the treating agent slip in order to prevent an excessive, albeit brief, increase in the treating agent slip at the cost of precisely maintaining the nitrogen oxide content.

CLAIMS



1. Process for regulating the amount of treating agent for reducing the nitrogen oxide content of the exhaust gases from combustion processes, in which the amount is regulated in accordance with the nitrogen oxide content, characterised in that a treating agent slip desired value (8) is used in addition to a predetermined nitrogen oxide content desired value (7) and is varied in accordance with the nitrogen oxide content value (3) measured in the exhaust gas (2).
2. Process according to claim 1, characterised in that the rate of change of the nitrogen oxide content value (3) measured is taken into account when varying the treating agent slip desired value (8).
3. Process according to claim 1 or claim 2, characterised in that ammonia is used as the treating agent, the ammonia not consumed in the nitrogen oxide reduction escaping as ammonia slip.