

The invention relates to a process for the recovery or disposal of ammonia or ammonium compounds produced during combustion processes and subsequent gas cooling and/or gas purification.

In order to reduce the nitrogen oxide concentration when treating waste gases from combustion processes, either ammonia is supplied to the gas flow in front of a reduction catalyst (SCR process), or ammonia or a substance which forms ammonia or ammonium compounds under the influence of heat (e.g. urea, ammonium carbonate or the like) is injected into the gas flow in the temperature range above 700°C (SNCR process). In both cases, some of the ammonia or the ammonium compounds is not used in the reaction for reducing the NO_x and is discharged together with the waste gases as what is referred to as ammonia slip. This can lead to contamination of both the atmosphere and the subsequent waste gas purification devices, if ammonia or ammonium compounds (ammonium chloride, ammonium sulphate, ammonium bisulphate) are removed from a filter plant together with the dusts.

Although the ammonium salts which are formed in the waste gas path at temperatures below 300°C can be separated off very effectively above all with cloth filters, there are problems with the further treatment of these filter dusts. The problems consist in that the filter dusts must be moistened with water for improved handling thereof. The ammonium salts then give off ammonia which escapes into the atmosphere. In order to prevent this uncontrolled escape of ammonia, which can also occur during subsequent dumping, the filter dusts can be subjected to a stripping process according to the state of the art, in which ammonia is substantially expelled. However, in this stripping process, filter dusts are heated by means of

steam or electrically and are possibly moistened, as a result of which heavy metals and compounds thereof, especially mercury, are also given off in gaseous form, this leading to further environmental problems.

The aim of the invention is to provide a process with the aid of which the ammonia contained in dust mixtures in the form of ammonium salts can be recovered.

This problem is solved according to the invention by the features specified in claim 1. By virtue of the batch treatment of the dust mixtures in a closed system, i.e. in closed mixers, the ammonia given off during moistening is filtered by vacuum, thereby preventing uncontrolled discharge into the atmosphere. The crucial advantage here is that no other harmful substances, e.g. heavy metals, are released, as the process is carried out at low temperatures.

In order if possible to recover all of the ammonia contained in the combined state in the dust mixtures, it is advisable when moistening the dust mixtures to increase the water content above the amount normally required for moistening allowing for proper transportation, i.e. to a water content of between 25 and 40 % by weight. In particular, an increase in the vacuum also leads to greater discharge of ammonia from these solid compounds.

The recovery of ammonia from dust mixtures is therefore particularly effective if the pH value of the dusts is greater than ten.

If the dust mixtures originate from a waste gas purification

process following a combustion process and a hot-gas denitrification plant (SNCR process), it is advisable in a further embodiment of the invention to return the ammonia recovered to the waste gas purification process, so that the quantity of new chemicals to be used for nitrogen oxide reduction can be reduced.

CLAIMS



1. Process for the recovery or disposal of ammonia or ammonium compounds from dust mixtures produced during combustion processes and subsequent gas cooling and/or gas purification, characterised in that the dusts produced are mixed with water in batches in a closed system at a temperature which is lower than or equal to the temperature at which the dusts leave the combustion, cooling or purification process, and the resulting vapours are discharged in a vacuum.
2. Process according to claim 1, characterised in that, in order to recover ammonia from the dust mixtures, the water content is adjusted to between 25 and 40 % by weight when moistening the dust mixtures.
3. Process according to claim 1 or claim 2, characterised in that the vacuum is increased in order to increase the quantity of ammonia to be expelled from the dust mixtures.
4. Process according to one of claims 1 to 3, characterised in that the pH value of the dusts is greater than ten or is adjusted to a value greater than ten.
5. Process according to one of claims 1 to 4, characterised in that the ammonia recovered is returned to the waste gas purification process.