

AIR PROTECTION FROM POWER INDUSTRY EMISSIONS

1.1. Nitrogen oxide emission reduction

1.1.3. Flue gas cleaning from nitrogen oxides

Basic methods of flue gas cleaning from nitrogen oxides

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In technical literature of the most countries, these methods of nitrogen oxide emission reduction are commonly called "secondary" (secondary measures), as opposed to "primary", which have been discussed in it. 1.1.2. This name comes from the fact that for economic reasons in boilers, firstly, technological methods of NO_x reduction are realized (use of low- NO_x burners, staged air or fuel supply, etc.) and only in case of ineffectiveness of the "primary" measures the more expensive "secondary" ones are usually introduced.

These methods are based on the decomposition of nitrogen oxides, already formed in the furnace due to interaction of the last with ammonia, urea or other derivatives of ammonia. These agents are called selective ones because they react with NO even in the presence of oxygen.

Under industrial conditions two methods of flue gas cleaning from NO_x are completely mastered and proved their

effectiveness

- Selective Catalytic Reduction - SCR (international abbreviation SCR);

- Selective non-catalytic reduction - SNCR (SNCR).

There are other methods of flue gas cleaning from NO_x under scientific development. Dry methods include, for example, adsorption by solid substances, irradiation of gas flow by an electron stream, etc.

There are also "wet" methods of flue gas cleaning from NO_x under study: adsorption by liquids with oxidation to nitrite-nitrate ion, with reduction to ammonium ion, etc. However, only SCR and SNCR methods are of practical interest for their implementation in power industry applied at the pulverized-coal boilers.