REVERSE PROCESS

Description
The Reverse-Process technology is based on periodic reversal (each 5-100 min) of gas flow through a catalyst bed to convert toxic admixtures to harmless compounds. The heat released during the reaction heats the gas to be purified, which makes the process autothermal. Periodic reversal of the gas flow facilitates the formation of a high-temperature reaction zone (300-600 °C) at the center of the catalyst bed, and the front inert layers serve for heat removal.

Industrial plant for processing metallurgical gases to sulfuric acid with a capacity of 100000 m³/h, (Pechenganikel’ mining and metallurgical complex)

Technical appraisal and economic benefits
• a high degree of purification of industrial gases 97-99.8%;
• low energy expenditures compared to conventional technologies:
  10 - 20 kJ/m³ at impurity concentration less than 0.5 g/m³;
  0 kJ/m³ at impurity concentration higher than 0.5 g/m³;
• an investment cost reduction by a factor of 1.5 - 3

Application areas
Purification of gas emissions, including low-concentration gases, from nitrogen oxides, ammonia, sulfur dioxide, and organic impurities, including chlorine-containing compounds. The Reverse-process technology can be employed in the ferrous and nonferrous industries, machine building, petrochemical and chemical industries (production of mineral fertilizers and explosives, plastics processing, etc.), food industries, etc.

Development stage
More than 30 plants of various capacities have been put into operation in Russia, CIS countries, United States, Japan, China, Bulgaria, and Australia. Plants abroad are being constructed by the Monsanto Env. - Chem. corporation (United States) under a license granted by the Boreskov Institute of Catalysis, SB RAS

Patent situation
Patents were granted in Russia (1996 and 1998) and the United States (1984 and 1989).

Commercial offers
Sale of licenses.
Delivery of plants on a turnkey basis.
Joint construction of plants.

Estimated cost
To be negotiated
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