air explodes in the range 16-27 (vol. %), and with increasing temperature and pressure the explosive limit expands.

The effect of temperature

Temperature has a slightly accelerating effect on the process, since the reaction is limited by external diffusion. At the same time, the *NO* yield varies with extreme temperature with a maximum in the range 900 - 920 ºC due to the progression in this region of the reaction, which proceeds with the formation of nitrogen and also thermal dissociation of ammonia and other side reactions:

$$4NH_3+3O_2 \rightarrow 2N_2+6H_2O+Q;$$

$$2NH_3 \rightarrow N_2+3H_2.$$

In addition, with increasing temperature, the entrainment of the catalyst in the form of volatile oxide - PtO_2 increases. To capture *Pt*, a *CaO*-based absorber is placed under the nets, which traps more than 50% of platinum. Taking into account the action of these opposite factors leads to the choice of the optimal temperature of 830-930ºC (depending on the combination of other parameters). The optimum temperature position depends on pressure. With increasing pressure, it shifts to the region of higher temperatures, although the value of the maximum yield decreases due to an increase in the specific gravity of the reaction with increasing pressure:

$$4NH_3+6NO \rightarrow 5N_2+6H_2O+Q$$

The effect of pressure

Pressure is a factor in accelerating the process, as it is the driving force of external diffusion. At the same time, with an increase in pressure, a decrease in the yield of nitric oxide (II) is observed. Therefore, the pressure is the optimal value combining the mutually opposite requirements of increasing productivity and reducing the dimensions of the installation and increasing the yield of *NO*. It should also be borne in mind that with increasing pressure, the entrainment of the smallest particles of platinum with gases increases significantly, which increases the cost of commercial acid, as platinum has a high cost. The process of capturing platinum from nitrous gases after the contact apparatus is very complex and does not provide a complete compensation for losses. In modern high-power installations, the optimum pressure is 0.4 - 0.7 MPa.

Contact time

The high selectivity of the catalysts allows, under conditions of optimal pressures, temperatures, and the $O_2: NH_3$ ratio, to reach 97–98% of the *NO* yield at almost complete ammonia conversion. Since *NO* can further decompose into elementary N_2 and O_2 as the contact time increases, the minimum time at which almost complete conversion is achieved and which provides the minimum reactor volume under conditions of almost complete NH_3 conversion is selected during the contact time. This time is $(1\text{-}2)\cdot10^{-1}$ s.