where ΔH_2 = 96 kJ, while maintaining the equimolecularity of the composition of the mixture of sulfur oxide (IV) and water vapor (1:1).

3) vapor condensation and sulfuric acid formation:

$$SO_3 + H_2O = H_2SO_4 - \Delta H_3,$$

where ΔH_3 = 92 kJ.

Thus, the wet catalysis process is described by the total equation:

$$H_2S + 2O_2 = H_2SO_4 - \Delta H_4,$$

where ΔH_4 = 707 kJ.

The nitrous method for producing sulfuric acid was first used in the middle of the 18th century and until the 20s of the 20th century was carried out using the *"chamber method"* in lead chambers. Then it was already carried out by *the "tower method"* in special towers.

The acid obtained by *the tower method* (*technical sulfuric acid*), as a rule, contains 75-76% H_2SO_4 and is somewhat contaminated with various impurities. The main consumer of industrial acid is the mineral fertilizer industry. The towers are laid out of acid-resistant ceramic plates with an outer casing of sheet steel. Inside, they are loosely filled with an acid resistant ceramic nozzle.

The tower method consists in the fact that in the first stage, the same for both methods, sulfur dioxide (SO_2) is obtained. The feedstock can, in principle, be any substance containing sulfur: natural iron sulfides (primarily pyrite FeS_2), as well as copper and nickel sulfides, sulfide polymetallic ores, gypsum $CaSO_4 \cdot 2H_2O$ and elemental sulfur. Sulfur-containing gases released during the processing and burning of fossil fuels (coal, oil) are also widely used.

The resulting SO_2 is oxidized to H_2SO_4, and nitrogen oxides are used for this in the nitrous method. From this stage, both methods differ from each other.

In a special oxidizing tower nitric oxide NO and NO_2 are mixed with air in such a ratio that there is half of the available NO and NO_2:

$$2NO + O_2 \rightarrow 2NO_2$$

As a result, the gas mixture contains equal NO and NO_2. It is fed to towers irrigated with 75% sulfuric acid; here the mixture of nitrogen oxides is absorbed with the formation of nitrosylsulfuric acid:

$$NO + NO_2 + 2H_2SO_4 \rightarrow 2NO(HSO_4) + H_2O$$

A solution of nitrosylsulfuric acid in sulfuric acid, called *nitrosa*, irrigates the towers, where SO_2 flows in counterflow and water is added. As a result of hydrolysis of nitrosylsulfuric acid, nitric acid is formed:

$$NO(HSO_4) + H_2O \rightarrow H_2SO_4 + HNO_2$$

Nitric acid then oxidizes SO_2 to H_2SO_4:

$$SO_2 + 2HNO_2 \rightarrow H_2SO_4 + 2NO$$