CATALYST AND PROCESS FOR SELECTIVE OXIDATION OF HYDROGEN SULFIDE INTO SULFUR FOR CLEANUP OF CLAUS UNITS TAIL GASES

**Description**

The new method of Claus unit tail gases cleanup from toxic sulfur admixtures is based on selective oxidation of hydrogen sulfide into elemental sulfur by oxygen of air. The process is characterized by minimum capital costs among all known cleanup processes in combination with high total level of sulfur recovery. The process uses new highly-efficient iron-oxide catalyst ICT-27-42 with selectivity of H₂S oxidation at the best world industrial level and with lifetime and consistency of operation exceeding this level, and, dislike currently applied catalysts, not containing chromium and other toxic compounds.

![Flow sheet of the process](image)

**Technical appraisal and economic benefits**

- minimum capital costs compared to all known Claus tail gas cleanup processes, low operation costs;
- increase of sulfur recovery level at Claus plant from 90—92% up to 99%, significant decrease of atmospheric sulfur emissions;
- high process stability, ease of process control;
- application of inexpensive industrial catalyst with high lifetime.

**Application areas**

Production of elemental sulfur from acid gases at oil refineries as well as gas-processing, chemical and metallurgical plants.

**Development stage**

Industrial production of ICT-27-42 catalyst is arranged. The industrial unit for the cleanup of Claus tails gases is in operation since October 2004 at Omsk refinery (Russia). Gas loading capacity of the unit – up to 10 tsh.m³/hour. Introduction of the unit provided decrease of sulfur atmospheric emission from the Omsk refinery by a factor of 4—5 or by 1500—2000 tons per annum.
Industrial unit at Omsk refinery.

Patent situation
The development is protected by Russian Patent (2004).

Commercial offers
Technology licensing, preparation of technical documentation for design of the cleanup plants, supervision at all stages (design, construction, catalyst loading, start-up works and operation) and supply of the catalyst.

Estimated cost
Estimated cost of ICT-27-42 catalyst is not higher than €10 000 per kg.

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