[0011a] In a first aspect, there is provided a process for odorizing a cryogenic fluid in a liquid state, comprising at least the following steps:

a) continuously feeding an odorizing agent in liquid or gaseous form, preferably in liquid form, into a feed zone, said feeding being carried out at a temperature above the temperature of the cryogenic fluid and above the crystallization temperature of the odorizing agent,

b) feeding said odorizing agent in liquid or gaseous form from step a) into a buffer zone in which the odorizing agent is brought to a temperature less than 30°C above the temperature of the cryogenic fluid, and

c) feeding said odorizing agent cooled in step b) into a contact zone, wherein said odorizing agent in a solid form comes into contact with said cryogenic fluid to be odorized.

[0011b] In another aspect, there is provided a device for introducing an odorizing agent into a cryogenic fluid in a liquid state, said device comprising:

1) a feed zone, which is fed with odorizing agent in liquid or gaseous form, preferably liquid form,

2) a buffer zone in which the liquid or gaseous odorizing agent is brought to a temperature of about the temperature of the cryogenic fluid, and

3) a contact zone, wherein said odorizing agent in a solid form comes into contact with said cryogenic fluid to be odorized.

CLAIMS

1. A process for odorizing a cryogenic fluid in a liquid state, comprising at least the following steps:

a) continuously feeding an odorizing agent in liquid or gaseous form, preferably in liquid form, into a feed zone, said feeding being carried out at a temperature above the temperature of the cryogenic fluid and above the crystallization temperature of the odorizing agent,

b) feeding said odorizing agent in liquid or gaseous form from step a) into a buffer zone in which the odorizing agent is brought to a temperature less than 30°C above the temperature of the cryogenic fluid, and

c) feeding said odorizing agent cooled in step b) into a contact zone, wherein said odorizing agent in a solid form comes into contact with said cryogenic fluid to be odorized.

2. The process as claimed in claim 1, wherein the flow rate of odorizing agent in the contact zone is proportional to the flow rate of the cryogenic fluid and, preferably, the flow rate of the odorizing agent in the contact zone is automatically controlled by the flow rate of the cryogenic fluid.

3. The process as claimed in claim 1 or claim 2, wherein the odorizing agent is brought, in step b), to a temperature less than 30°C, preferably less than 20°C, more preferably less than 10°C, above the temperature of the cryogenic fluid to be odorized.

4. The process as claimed in any one of the preceding claims, wherein the concentration of odorizing agent in the cryogenic fluid is between 0.1 mg/m^3 (n) and 500 mg/m^3 (n), preferably between 0.5 mg/m^3 (n) and 100 mg/m^3 (n), more preferably between 0.5 mg/m^3 (n) and 50 mg/m^3 (n).

5. The process as claimed in any one of the preceding claims, wherein the odorizing agent is chosen from terpenes, alcohols, phenols, aldehydes, ethers, esters, fatty acids, ketones, lactones and nitriles, pyrazine compounds, mercaptans, cyclic sulfides, dialkyl sulfides, dialkyl disulfides, or else from selenium derivatives, alone or in mixtures of two or more, in any proportions.

6. The process as claimed in any one of the preceding claims, wherein the odorizing agent is chosen from methyl ethyl sulfide, dimethyl sulfide, diethyl sulfide, dimethyl disulfide, diethyl disulfide, methyl mercaptan, ethyl mercaptan, *tert*-butyl mercaptan, *sec*-butyl mercaptan, *iso*-propyl mercaptan, n-propyl mercaptan, cyclohexyl mercaptan, tetrahydrothiophene, methyl acrylate, ethyl acrylate, methyl methacrylate, ethyl methacrylate, methylethylpyrazine, dimethyl selenide and dimethyl diselenide.

7. The process as claimed in any one of the preceding claims, wherein the odorizing agent is used pure, mixed or diluted with other compounds compatible with the cryogenic fluid, in particular with one or more solvents chosen from C_5-C_6 alkanes, alcohols, ethers, esters, ketones, sulfones, sulfoxides, and preferably chosen from alkanes, alcohols and ethers.

8. The process as claimed in any one of the preceding claims, wherein the odorizing agent also comprises one or more additives chosen from heat stabilizers, dyes and antioxidants.

9. The process as claimed in any one of the preceding claims, wherein the cryogenic fluid is Liquefied Natural Gas.

10. A device for introducing an odorizing agent into a cryogenic fluid in a liquid state, said device comprising:

1) a feed zone, which is fed with odorizing agent in liquid or gaseous form, preferably liquid form,

2) a buffer zone in which the liquid or gaseous odorizing agent is brought to a temperature of about the temperature of the cryogenic fluid, and

3) a contact zone, wherein said odorizing agent in a solid form comes into contact with said cryogenic fluid to be odorized.

11. The device as claimed in claim 10, wherein the buffer zone b) is equipped with mechanical assistance.