A B S T R A C T

METHOD FOR LIQUEFYING A NATURAL GAS, INCLUDING A PHASE CHANGE

The present invention relates to a process for liquefying a natural gas in at least one cryogenic heat exchanger (EC1) by flowing in indirect contact with at least one stream (S1) of refrigerant fluid entering said heat exchanger (EC1) at a first inlet (AA1) substantially at the temperature T0 and at a pressure P1, and flowing through the heat exchanger as a co-current with said natural gas stream (Sg), leaving the heat exchanger (BB) in the liquid state, then being expanded by an expander (D1) at the cold end (BB) of said heat exchanger (EC1) in order to return to the gaseous state at a pressure P'1 less than P1 and at a temperature T1 less than T0, prior to leaving the hot end (AA) of said heat exchanger (EC1) via an outlet orifice (AA3) in the gaseous state and substantially at a temperature T0. Said refrigerant fluid in the gaseous state is then reliquefied at least in part and taken to the inlet (AA1) of said heat exchanger via compression in a first compressor (C1) followed by partial condensation in a first condenser (H0) and phase separation, a first liquid phase (d1a) being taken at least in part to said first inlet (AA1), a first gaseous portion (d1b) being compressed by a second compressor (C1A) and then cooled in a desuperheater (DS) by contact with a portion (d1c) of said first liquid phase (d1a) at the outlet from said first separator, prior to condensing in a second condenser (H1).