

Title (en)  
METHOD FOR SEPARATING AIR BY CRYOGENIC DISTILLATION AND INSTALLATION THEREFOR

Title (de)  
VERFAHREN ZUR LUFTZERLEGUNG DURCH TIEFTEMPERATURDESTILLATION

Title (fr)  
PROCEDE DE SEPARATION D'AIR PAR DISTILLATION CRYOGENIQUE

Publication  
**EP 1446621 A2 20040818 (FR)**

Application  
**EP 02793161 A 20021008**

Priority  
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• FR 0113362 A 20011017

Abstract (en)  
[origin: FR2830928A1] The medium pressure column operates at between 6 and 9 bars absolute, preferably between 6.5 and 8.5 bars and the ratio between the total quantity of air V entering the exchange line and the total volume in the exchange line is between 3000 and 6000 Nm<sup>3</sup>/h/m<sup>3</sup>. The process uses a medium pressure column (9) and a low pressure column (11) thermally connected to each other so a quantity V of compressed and purified air is cooled in an exchange line (10) to a cryogenic temperature and at least part is sent to the medium pressure column. Flows rich in oxygen and in nitrogen (LR, LP) are sent from the medium pressure column to the low pressure column and flows (35, 23) rich in nitrogen and oxygen are extracted from the low pressure column. A liquid rich in oxygen (23) is sent from the low pressure column (11) to a reboiler (21) where it is partially vaporized by heat exchange with a gas rich in nitrogen from the medium pressure column (9). The reboiler has a DELTA T of at least 2.5 deg. C. Part of the compressed and purified air is sent to an insufflation turbine (19) with an inlet temperature of between -50 and -90 deg. C. The ratio between the quantity of air V and the flow of air sent to the turbine is between 20 and 40. The medium pressure column contains two or three sections of structured packing (I, II, III) and/or the low pressure column contains three sections of structured packing (I, II, III). At least one flow of liquid is extracted from a column, pressurized and vaporized. The pressure loss in the exchange line is more than 200mbar for a residual nitrogen flow (35) from the low pressure column and more than 250mbars for the air flow (13) at the lowest pressure. The ratio between the air quantity V and the air flow D (1) is between 20:1 and 40:1. An expansion turbine for liquid air is fed by all or part of a liquid air flow leaving the exchange line and/or a refrigerating group where frozen water produced by a refrigerating group (which can be the same water circuit as that cooling the air at the inlet to purification) cools the air leaving an air suppressor (5, 7) and/or the lowest pressure air and/or an increased proportion of air is sent to the insufflating turbine so the ratio between the air quantity V sent to the exchange line and the air flow D sent to the insufflating turbine is less than 20:1. The purification of the oxygen is between 85 and 100%, preferably between 95 and 100% and the oxygen yield is between 85 and 100%. An Independent claim is also included for an installation for carrying out the above process, possibly with an argon column fed from the low pressure column.

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