Title (en)

Method and device for completely condensing a process gas by cryocondensation

Title (de)

Verfahren und Vorrichtung zu vollständigen Kondensation eines Prozessgases mittels Kryokondensation

Title (fr)

Procédé et dispositif pour condenser complètement un gaz de processus par cryo-condensation

Publication

EP 3026379 A1 20160601 (EN)

Application

EP 14194689 A 20141125

Priority

EP 14194689 A 20141125

Abstract (en)

The present invention relates to a method and a device for completely condensing a process gas (P) by cryocondensation, comprising the following steps: cooling a gaseous cooling medium circulating in a cooling loop (10) by a liquid cooling medium in a main heat exchanger (11), whereby vaporizing the liquid cooling medium, feeding the vaporized cooling medium into the cooling loop (10) upstream of the main heat exchanger (11), cooling heat exchange surfaces (5) in a condenser (3) by the gaseous cooling medium circulating in the cooling loop (10), feeding the process gas (P) to be condensed into the condenser (3) to bring it into contact with the heat exchange surfaces (5) in the condenser (3), collecting the condensed process gas (P) as liquid product (LP) in a product container (8), and extracting gaseous cooling medium by an extractor (16) from the cooling loop (10) and guiding it through a pre-cooler (2) for pre-cooling the process gas (P) before feeding it into the condenser (3). The invention allows to completely condensate a process gas (P) by using the cold of a liquid cooling medium in three steps. In a main heat exchanger (11) the phase transfer from liquid to gas is used. In a second step the still very cold gas is introduced into the cooling loop (10), and in a final step the temperature difference between the cooling loop (10) after the heat exchange surfaces (5) in the condenser (3) compared to the environment (25) is mostly used in a pre-cooler (2). This highly efficient use of the cold allows using the process and the device according to the invention on an industrial scale for completely condensing a process gas (P).

IPC 8 full level

F25J 1/00 (2006.01); **B01D 5/00** (2006.01); **F25J 1/02** (2006.01)

CPC (source: EP)

F25J 1/0072 (2013.01); **F25J 1/0222** (2013.01); **F25J 1/0244** (2013.01); F25J 2210/42 (2013.01); F25J 2230/08 (2013.01); F25J 2230/42 (2013.01); F25J 2245/42 (2013.01)

Citation (applicant)

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- [A] WO 2009080678 A2 20090702 - SHELL INT RESEARCH [NL], et al
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Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

EP 3026379 A1 20160601

DOCDB simple family (application)

EP 14194689 A 20141125