Title (en)

Process for the dewatering, deactification and degasolination of natural gas, using a mixture of solvents

Title (de)

Verfahren zur Entfernung von Wasser, Saüren und Benzin aus Erdgas, unter Verwendung eines Lösungsmittelgemisches

Title (fr)

Procédé de déshydratation, de désacidification et de dégazolinage d'un gaz naturel, utilisant un mélange de solvants

Publication

EP 0783031 B1 20010926 (FR)

Application

EP 96402909 A 19961227

Priority

FR 9515626 A 19951228

Abstract (en)

[origin: EP0783031A1] A process for the natural gas dehydration and/or de-acidification and/or gasoline removal involves: (a) contacting a fraction of the gas with an aqueous phase containing MeOH, to produce a gaseous effluent charged with MeOH; (b) contacting the gas with a solvent mixture comprising MeOH, water and a solvent heavier than MeOH, the effluent being partially free from acid gases; (c) regenerating the mixture of solvents from (b) by pressure reduction and/or heating, liberating the acid gases, the re-generated solvent mixture being re-cycled to step (b); and (d) cooling the gas from step (b) to produce an aqueous phase containing MeOH which is re-cycled to (a). In an example, the composition of the natural gas was (in kg/h): water 60.55; N2 782.37; CO2 8770.15; CH4 31699.87; C2H6 5210.67; C3H8 3088.88; i-C4H10 625.43; n-C4H10 1024.58; iso-C5H12 330.39; n-C5H12 297.37; n-C6H14 118.29; n-C7H16 343.99. Total = 52352.54 The gas to be treated is admitted at (1), at 30 degrees C. and 70 bars and flow rate 52352 kg/h.50% of the gas was injected into the contact column (C1) via (2), and a solution containing 65% wt. of MeOH in water, at 159 kg/h and 30 degrees C. , was injected counter-currently via (3). From the base of C1 an aqueous phase was eliminated (40) containing 12 ppm of MeOH at 60 kg/h. From the head of (C1), the gas charged with MeOH was evacuated via (4) and mixed with gas which had not been passed through (C1). The gas obtained was sent via (6) to column (C2). A solution containing 20% wt. of MeOH and 20% wt. of diethanolamine in water was injected counter-currently via (7) at 40 degrees C. with a flow rate of 117409 kg/h. From the base of (C2) the solvent mixture charged with CO2 was recovered by 8 at 46 degrees C. The gas evacuated from the head of (C2) by (9) contained only 1.8% wt. of CO2. The gas was cooled by (E3) and (E4) at -26 degrees C. The triphase mixture obtained was separated in the chamber (B2), and the treated gas evacuated via (14) at 44889 kg/h. The liquid hydrocarbon phase obtained was evacuated at (15) and the aqueous phase containing MeOH was partially re-cycled to (C1) via (41) the other part (75%) being sent to the chamber (B20). The solvent mixture charged with CO2 was expanded to 10 bars by the valve (V1), then sent to (B1). The liquid phase from (B1) was sent via (10) to exchanger (E1), where it was re-heated to 60 degrees C. It was then expanded to 1.5 bar and injected into the distillation column (D1). This was cooled at the head to 40 degrees C and heated at the base. The solvent mixture recovered via (12) at 80 degrees C. was pumped (P1) then cooled in (E1) and (E2) before being re-cycled to (C2). The gas from the head of (D1), via (11), was cooled to -26 degrees C after passing through (E5). The chamber (B20) allowed separation of a liquid phase containing MeOH and water, and a gaseous phase comprising CO2.The aqueous phase was re-cycled to (C2) via (43). The gaseous phase was evacuated via (23).

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