Claims

1. A system for recovering natural gas liquid from a gas source (210), comprising:

compression means (206) for increasing the temperature and pressure of the fluid from the gas source;

cooling means (230) for cooling the fluid from the compression means;

at least one gas/gas heat exchanger (204), fluid from the cooling means flowing from a first inlet to a first outlet;

at least one separator (208) for receiving the fluid from the first outlet of the gas/gas heat exchanger (204) and separating liquid from the gas;

the gas from the separator being directed to expansion means (206) for reducing the temperature and pressure of the gas;

the aqueous part of the liquid from the separator and the gas from the expansion means being directed to the gas/gas heat exchanger (204) where they flow therethrough from a second inlet to a second outlet for cooling the fluid flowing between the first inlet and first outlet;

wherein injection means are provided between the cooling means and the gas/gas heat exchanger for saturating gas from the cooling means (230) with a liquid agent;

characterised in that the liquid agent comprises an evaporant and an antifreeze agent; and

a recovery vessel (240) is provided downstream of the second outlet, the antifreeze agent being recoverable therein for injection into the fluid from the gas source upstream of the first inlet;

wherein the expansion means and compression means are provided by respective sides of a turbo expander; and

wherein the aqueous part of the liquid from the separator and gas from the expansion means is warmed by the gas/gas heat exchanger as they flow from the second inlet to the second outlet such that evaporant is vaporised thereby increasing recovery of the antifreeze agent.

2. The system according to claim 1 wherein the evaporant is water.

3. The system according to any preceding claim wherein the antifreeze agent is monoethylene glycol or monopropylene glycol.

4. The system according to any preceding claim wherein the separator is provided with a heater for de-emulsifying the liquid in the separator.

5. The system according to claim 4 wherein the heater is located in a separate vessel which receives liquid from the bottom of the separator, warms the liquid, then returns the liquid to the separator.

6. The system according to any preceding claim wherein the cooling means is a seawater or air cooler, which does not significantly change the pressure of the fluid.

7. The system according to any preceding claim wherein the gas/gas heat exchanger comprises a series of heat exchangers and/or a multi-section heat exchanger comprising independent compartments within the same closure.

8. The system according to any preceding claim wherein the liquid separated in the separator comprises an aqueous part and a condensate, the condensate comprising hydrocarbons which are directed to an outlet for further treatment, the aqueous part comprising the liquid agent.

9. The system according to claim 8 wherein the condensate from the separator is spiked into a surge vessel, provided for separating gas, water and oil at low pressure, the condensate being directed through a column of material through which gas from the surge vessel passes in the opposite direction to strip off C3-components from the condensate and recover heavy ends from the gas.