Claims

1. A gas production system including a first heat exchange unit (13) that cools source gas (L1) that is taken in from outside, and a rectification unit having one or two or more rectification columns (20,21,22) for obtaining liquefied gas by rectifying liquefied source gas obtained by cooling in the first heat exchange unit, comprising:

- a single pressure device having a single pressurised container (31) to which liquefied gas extracted from the rectification unit is supplied, a pressure line (L5l) for extracting and vaporizing a part of the liquefied gas in the pressurised container and returning the part of the liquefied gas to the pressurised container, and a second heat exchange unit (32) that is disposed in the pressure line;
- a liquefied gas storage unit (41) that stores liquefied gas (L6) which is led out from the pressurised container of the pressure device; and
- a product gas extraction line (L7) for supplying the liquefied gas as a product gas by causing liquefied gas to pass through the first heat exchange unit from the liquefied gas storage unit to perform heat exchange with the source gas.

2. The gas production system according to claim 1, comprising:

- a source gas supply line (L1) that supplies the source gas to the rectification unit (20,21) via the first heat exchange unit (13);
- a source gas flow rate measurement unit (11) that is installed at an upstream side of the first heat exchange unit, of the source gas supply line;
- a first control valve (12) that is installed upstream of the source gas supply line, and controls a supply amount of the source gas based on a flow rate measured by the source gas flow rate measurement unit;

- a product gas measurement unit (51) that is installed at a downstream side of the first heat exchange unit, of the product gas extraction line and measures a value concerning product gas; and
- a second control valve (52) that is installed in the product gas extraction line, and controls an extraction amount of the product gas based on a result measured by the product gas measurement unit.

3. The gas production system according to claim 1 or 2, the gas production system further comprising:
- a recycle source gas compressor (153) that compresses recycle source gas (R1) that is extracted from a column upper portion of a rectification column (20), preferably at a most upstream side (top end), of the rectification columns;
- an expansion turbine (151) including an oil brake that expands waste gas (R3) extracted from the column upper portion of the rectification column at the most upstream side or waste gas extracted from a position different from an extraction position of the recycle source gas; and
- a control unit (60) that controls an amount of cold that is provided to a first heat exchanger, in accordance with variation of the product gas extraction amount.

4. The gas production system according to claim 3, further comprising a first condenser (213) that is disposed in the column upper portion of the rectification column at the most upstream side, and a second condenser (214) that is disposed at a lower position near to the first condensation unit,
- wherein the recycle source gas compressor compresses recycle source gas (R1) that is extracted from a certain position of the first condenser, and
- the expansion turbine (151) including the oil brake (152) expands waste gas (R3) that is extracted from a certain position of the second condenser.

5. The gas production system according to claim 3, further comprising a single condenser (213) that is disposed in the column upper portion of the rectification column (20,21) at the most upstream side,

- wherein the recycle source gas compressor (153) compresses recycle source gas that is extracted from a certain position of the condenser, and
- the expansion turbine (151) including the oil brake (152) expands the waste gas that is extracted from the certain position of the condenser.

6. The gas production system according to claim 1 or 2, further comprising an introduction line (L9) that introduces liquid nitrogen or liquid oxygen, in the column upper portion of the rectification column (20,21).

7. The gas production system according to any one of claims 1 to 6, comprising a liquefied source gas buffer that stores the liquefied source gas, at a subsequent stage of the first heat exchange unit (13).

8. The gas production system according to any one of claims 3 to 5, wherein the control unit calculates cold that is recovered in the first heat exchange unit (13), from a flow rate of product gas, which is measured in the product gas flow rate measurement unit (51), and controls the expansion turbine (151) including the oil brake (152) based on the calculated cold.

9. The gas production system according to claim 8, wherein the control unit controls a flow rate of the expansion turbine (151), or controls a load on the oil brake (152), in accordance with the cold.

10. The gas production system according to any one of claims 1 to 9, comprising:

- a branch line (R13, L71) that is branched at a previous stage of the first heat exchange unit of the product gas extraction line;
- a gate valve (53) that is installed in the branch line, and switches feeding of the liquefied gas to the branch line and/or the product gas extraction line;
- an extraction control unit (50) that controls the gate valve to feed the liquefied gas to the branch line and/or the product gas extraction line; and
- a third heat exchange unit (55) that is disposed in the branch line.