

CLAIMS

1. A plasma processing apparatus comprising:
 - a plasma processing chamber having a substrate support
 - 5 configured to support a substrate;
 - a shower head having a plurality of gas inlets
 - configured to introduce a gas into respective regions in the
 - plasma processing chamber;
 - a gas supply configured to supply a gas to the plurality
 - 10 of gas inlets;
 - a plasma generator configured to generate a plasma of
 - the gas; and
 - a controller configured to control at least the gas
 - supply,
 - 15 wherein the gas supply includes:
 - a gas unit configured to supply a common gas to the
 - plurality of gas inlets;
 - a flow splitter configured to distribute the common gas
 - supplied from the gas unit and supply the common gas to the
 - 20 plurality of gas inlets;
 - a valve disposed in a gas flow path between the flow
 - splitter and the plurality of gas inlets; and
 - an injection unit configured to supply an injection gas
 - to the selected gas inlet among the plurality of gas inlets,

wherein the injection unit is configured to be connected to a gas flow path between the flow splitter and the valve, and

wherein the controller controls the injection unit so that two or more types of injection gases are supplied to two different ones of the plurality of gas inlets.

2. The plasma processing apparatus of claim 1, wherein the injection unit comprises:

a plurality of first gas flow paths branched from the gas unit;

a plurality of second gas flow paths, wherein one side of the plurality of second gas flow paths is connected to at least one of the plurality of first gas flow paths, and the other side of the plurality of second gas flow paths includes a branch part; and

a third gas flow path connected to the branch part; and

a flow rate controller disposed in both the plurality of first gas flow paths and the third gas flow path.

3. The plasma processing apparatus of claim 2, comprising a merging part of the plurality of the first gas flow paths and a merging part of the third gas flow path.

4. The plasma processing apparatus of claim 3, wherein the injection unit comprises an opening-closing

valve disposed in all of gas flow paths between the flow rate controller and the merging part in the first gas flow path.

5 5. The plasma processing apparatus of any one of claims 1 to 4,

 wherein the injection unit is configured to be able to select a type of injection gas for each gas inlet.

10 6. The plasma processing apparatus of any one of claims 1 to 5, wherein the injection unit is configured to be able to adjust a flow rate of the injection gas for each gas inlet.

 7. The plasma processing apparatus of any one of claims 1 to 6,

15 wherein the controller
 repeats a first step and a second step to perform plasma processing on the substrate, and

 switches at least one of a gas type and a flow rate of the injection gas supplied to each gas inlet in the first step
20 and the second step.