

What is claimed is:

1. A gas phase etching apparatus, comprising:

a reaction chamber body, which defines a space for forming a reaction chamber;

a base, which is arranged within the reaction chamber and configured to support a workpiece being processed;

a gas intake element, which is connected to the reaction chamber body and configured to introduce an etchant into the reaction chamber; and

a pressure control component, which is connected to the reaction chamber body and configured to control a pressure in the reaction chamber,

wherein, the apparatus further comprises:

a first temperature controller, which is connected to the reaction chamber body and configured to control a temperature in the reaction chamber to a first temperature, the first temperature being a temperature at which the reaction chamber is not corroded by the etchant; and

a second temperature controller, which is connected to the base and configured to control a temperature of the base to a second temperature, the second temperature being a temperature at which the workpiece being processed supported by the base satisfies a temperature requirement for directly performing a subsequent process; and

a lining component, which is placed in an inner space of the reaction chamber body and configured to cover a sidewall of the reaction chamber body;

wherein the lining component comprises a first liner and a second liner, a reaction by-product enters the pressure control component at least via a gap between the base and the first liner and a gap between the first liner and the second liner.

2. The gas phase etching apparatus of claim 1, wherein the first temperature controller controls the temperature in the reaction chamber to the first temperature through heat conduction, heat radiation and/or heat convection by controlling gas, liquid or solid media; and/or

the second temperature controller controls the temperature of the base to the

second temperature through heat conduction, heat radiation and/or heat convection by controlling gas, liquid or solid media.

3. The gas phase etching apparatus of claim 2, wherein the first temperature is in a range of 50°C-90°C.

4. The gas phase etching apparatus of claim 2, wherein the second temperature is in a range of 20°C-60°C.

5. The gas phase etching apparatus of claim 1, wherein the pressure control component comprises:

a pressure controller, which is configured to adjust a pressure in the reaction chamber to be in a range of 30Torr~300Torr to improve an etch selectivity ratio.

6. The gas phase etching apparatus of claim 1, further comprising:

a showerhead, which is located in an upper region of the reaction chamber and connected to the gas intake element;

wherein the showerhead comprises an upper uniform flow plate and a lower uniform flow plate, the etchant enters the reaction chamber via the upper uniform flow plate and the lower uniform flow plate of the showerhead, and

wherein a size of a hole of the upper uniform flow plate is larger than that of the lower uniform flow plate.

7. The gas phase etching apparatus of claim 1, wherein the gap between the base and the first liner is smaller than the gap between the first liner and the second liner.

8. The gas phase etching apparatus of claim 1, wherein the gas intake element introduces a dehydrated hydrogen fluoride gas and a dehydrated alcohol gas into the reaction chamber; and

the dehydrated hydrogen fluoride gas and the dehydrated alcohol gas are mixed to remove silicon dioxide on the workpiece being processed.

9. A gas phase etching equipment, comprising: a transferring apparatus and the gas phase etching apparatus of any one of claims 1 to 8, wherein the transferring apparatus is connected to the gas phase etching apparatus such that the workpiece being processed is transferred between the transferring apparatus and the gas phase etching apparatus.