

What is claimed is:

1. A substrate washing device comprising:
 - a substrate holding mechanism that holds a substrate;
 - a substrate rotating mechanism that rotates the substrate held by the substrate holding mechanism;
 - a carrier gas source;
 - a washing liquid source; and
 - a two-fluid nozzle which is in communication with the carrier gas source and the washing liquid source, that ejects a high speed two-fluid jet containing a carrier gas and droplets of a washing liquid toward a surface of the rotating substrate, wherein the ejection speed of the two-fluid jet is at lowest 200 m/sec or higher;
- wherein the washing liquid source comprising
 - a specific-resistance adjusting mechanism, which is connected to a CO₂ gas source and a pure water source and configured to generate a washing liquid to be supplied to the two-fluid nozzle therein while adjusting the specific resistance value of the washing liquid by mixing the CO₂ gas and the pure water and ionizing the washing water, wherein the specific resistance value of the washing liquid can be adjusted lower so that the electrification amount of the surface of the substrate is to be suppressed; and

a flow-rate adjusting mechanism which is connected to the specific-resistance adjusting mechanism to adjust a flow-rate of the washing liquid supplied from the specific-resistance adjusting mechanism to the two-fluid nozzle, wherein the flow rate of the washing liquid can be adjusted higher so that the electrification amount of the surface of the substrate is to be suppressed;

wherein the high speed two-fluid jet ejected from the two-fluid nozzle contains (1) the droplets of the washing liquid whose specific resistance value and the flow-rate are adjusted to suppress the amount of electrification of the droplets and (2) the carrier gas.

2. The substrate washing device according to claim 1, further comprising

a rinse-liquid supply nozzle that supplies a rinse liquid toward the surface of the substrate, wherein the rinse-liquid supply nozzle is capable of supplying the washing liquid to the surface of the substrate.

3. The substrate washing device according to claim 1, further comprising a rinse-liquid nozzle (62);

wherein the rinse-liquid nozzle is configured to supply a rinse liquid to the substrate.

4. The substrate washing device according to claim 1,
further comprising a chemical-liquid nozzle (64);

wherein the chemical-liquid nozzle is configured to
supply a chemical liquid to the substrate.

5. The substrate washing device according to claim 1,
further comprising a control unit to control the substrate
washing device.