

What is claimed is:

1. A plasma generating system, comprising:

a plasma cavity for generating a plasma therewithin by use of microwave energy;

a flow inlet being configured to introduce a gas into a center of the plasma cavity;

a detection unit for measuring intensities of light emitted by the plasma in an ultraviolet (UV) range and an infrared (IR) range; and

a controller for controlling the detection unit.
2. A plasma generating system as recited in claim 1, further comprising:

a waveguide coupled to the plasma cavity; and

a hollow cylinder protruding from a wall of the waveguide and having a bottom cap that includes an aperture,

wherein the detection unit is arranged to receive the light through the aperture.
3. A plasma generating system as recited in claim 2, wherein the aperture is dimensioned to prevent leakage of the microwave energy therethrough.
4. A plasma generating system as recited in claim 1, wherein the detection unit includes:

a sensor for converting light into an electrical signal; and

a board having an electrical circuit, the sensor being mounted on the board,

wherein the electrical circuit conditions the electrical signal and sends the electrical signal to the controller.

5. A plasma generating system as recited in claim 4, further comprising:

a switchable bandpass filter disposed in front of the sensor and having one or more bandpass filters that each pass light in a wavelength range.

6. A plasma generating system as recited in claim 1, further comprising:

a lens for collecting the light onto the detection unit.

7. A plasma generating system as recited in claim 1, wherein the detection unit includes:

a first sensor for measuring intensity of the light in the UV range; and

a second sensor for measuring intensity of the light in the IR range.

8. A plasma generating system as recited in claim 7, further comprising:

a first bandpass filter disposed in front of the first sensor and configured to pass the light in the UV range; and

a second bandpass filter disposed in front of the second sensor and configured to pass the light in the IR range.

9. A plasma generating system as recited in claim 1, further comprising:

a waveguide coupled to the plasma cavity; and

an optical fiber installed in the waveguide and having one end for receiving the light and an other end coupled to the detection unit.

10. A plasma generating system as recited in claim 1, further comprising:

a waveguide for transmitting the microwave energy therethrough;

an inner wall disposed within the waveguide to define the plasma cavity;

an adaptor mounted on the waveguide and configured to introduce a gas into the plasma cavity and generate a vortex flow within the plasma cavity using the gas, the adaptor having a through hole through which a gas processed by the plasma exits the plasma cavity; and

an optical fiber installed in the adaptor and having one end for receiving the light and an other end coupled to the detection unit.

11. A plasma generating system as recited in claim 1, further comprising:

a waveguide for transmitting the microwave energy therethrough;

a forward flow inlet mounted on the waveguide and configured to introduce a gas into the plasma cavity and generate a vortex flow within the plasma cavity using the gas; and

an optical fiber installed in the forward flow inlet and having one end for receiving the light and an other end coupled to the detection unit.