**CLAIMS**

1. A sensor for detecting radical ion flux, comprising:

a first resistor, wherein the first resistor comprises an exposed length of a wire of a first catalytic composition; and

a second resistor electrically coupled to the first resistor, wherein the second resistor comprises a length of wire of the first catalytic composition, wherein the second resistor is coated with a non-catalytic material.

2. The sensor of claim 1, wherein the first resistor and the second resistor are connected to each other in a Wheatstone bridge configuration.

3. The sensor of claim 2, wherein changes to a voltage across the Wheatstone bridge correlate to a temperature change of the first resistor induced by radical ion recombination.

4. The sensor of claim 1, wherein the first catalytic composition comprises platinum.

5. The sensor of claim 1, wherein the first catalytic composition comprises nickel.

6. The sensor of claim 1, wherein the non-catalytic material comprises silicon and oxygen.

7. The sensor of claim 1, wherein the non-catalytic material comprises aluminum and oxygen.

8. The sensor of claim 1, wherein the sensor is integrated onto a substrate that is insertable into a plasma chamber.

9. A plasma processing tool, comprising:

a chamber; and

a sensor according to any one of claims 1 to 8.

10. The plasma processing tool of claim 9, wherein the sensor is on a probe that extends over a support for holding a substrate.

11. The plasma processing tool of claim 9, wherein the sensor is in an exhaust line coupled between the chamber and a vacuum pump.

12. The plasma processing tool of claim 9, further comprising:

a remote plasma source, wherein the sensor is located within the remote plasma source.