

Amendments to the Claims

Please amend claims 45, 58, 70, and 78 as follows:

45. (Currently Amended): An apparatus for generating a strongly-ionized plasma, the apparatus comprising:

- a. an ionization source that generates a weakly-ionized plasma from a feed gas contained in a chamber, the weakly-ionized plasma ~~reducing~~ substantially eliminating the probability of developing an electrical breakdown condition in the chamber; and
 - b. a power supply that supplies power to the weakly-ionized plasma through an electrical pulse that is applied across the weakly-ionized plasma, the electrical pulse having at least one of a magnitude and a rise-time that is sufficient to transform the weakly-ionized plasma to a strongly-ionized plasma without developing an electrical breakdown condition in the chamber.
46. (Original): The apparatus of claim 45 wherein the pulsed power supply is a component in the ionization source.
47. (Original): The apparatus of claim 45 wherein the ionization source is chosen from the group comprising an electrode coupled to a DC power supply, an electrode coupled to an AC power supply, a UV source, an X-ray source, an electron beam source, an ion beam source, an inductively coupled plasma source, a capacitively coupled plasma source, and a microwave plasma source.

48. (Original): The apparatus of claim 45 wherein the power supply generates a constant power.
49. (Original): The apparatus of claim 45 wherein the power supply generates a constant voltage.
50. (Original): The apparatus of claim 45 wherein the power supply supplies power to the weakly ionized plasma at a time that is between about fifty microsecond and five second after the ionization source generates the weakly-ionized plasma.
51. (Original): The apparatus of claim 45 wherein the power supply supplies power to the weakly ionized plasma for a duration that is sufficient to generate a quasi-static electric field across the weakly-ionized plasma.
52. (Original): The apparatus of claim 45 wherein the cathode is generally formed in the shape of at least one circular disk.
53. (Original): The apparatus of claim 45 wherein the ionization source generates the weakly-ionized plasma from a reactive feed gas contained in a chamber.
54. (Original): The apparatus of claim 45 further comprising a magnet that is positioned to generate a magnetic field proximate to the weakly-ionized plasma, the magnetic field trapping electrons in the weakly-ionized plasma.
55. (Original): The apparatus of claim 54 wherein the magnet generates a magnetic field that is shaped to trap secondary electrons that are produced by ion bombardment.

56. (Original): The apparatus of claim 45 further comprising a gas line that is coupled to the chamber, the gas line supplying feed gas to the strongly-ionized plasma that transports the strongly-ionized plasma by a rapid volume exchange.
57. (Original): The apparatus of claim 56 wherein the gas volume exchange permits additional power to be absorbed by the strongly-ionized plasma.
58. (Currently Amended): A method for generating a strongly-ionized plasma, the method comprising:
- a. ionizing a feed gas in a chamber to form a weakly-ionized plasma that ~~reduces~~ substantially eliminates the probability of developing an electrical breakdown condition in the chamber; and
 - b. supplying an electrical pulse across the weakly-ionized plasma that excites atoms in the weakly-ionized plasma, thereby generating a strongly-ionized plasma without developing an electrical breakdown condition in the chamber.
59. (Original): The method of claim 58 wherein the ionizing the feed gas comprises exposing the feed gas to one of a static electric field, an pulsed electric field, UV radiation, X-ray radiation, electron beam radiation, and an ion beam.
60. (Original): The method of claim 58 wherein at least one of a rise time and magnitude of the electrical pulse supplied across the weakly-ionized plasma is selected to increase a density of the weakly-ionized plasma.

61. (Original): The method of claim 58 wherein at least one of a rise time and magnitude of the electrical pulse supplied across the weakly-ionized plasma is selected to excite atoms in the weakly-ionized plasma to generate secondary electrons that increase an ionization rate of the weakly-ionized plasma.
62. (Original): The method of claim 58 wherein at least one of a rise time and magnitude of the electrical pulse supplied across the weakly-ionized plasma is selected to improve uniformity of the strongly-ionized plasma.
63. (Original): The method of claim 58 further comprising supplying feed gas to the strongly-ionized plasma to transport the strongly-ionized plasma by a rapid volume exchange.
64. (Original): The method of claim 63 wherein the transport of the strongly-ionized plasma by the rapid volume exchange permits additional power to be absorbed by the strongly-ionized plasma.
65. (Original): The method of claim 58 wherein the supplying the electrical pulse comprises applying a quasi-static electric field across the weakly-ionized plasma.
66. (Original): The method of claim 58 wherein the electrical pulse comprises a rise time that is between about 0.1 microsecond and 10 seconds.
67. (Original): The method of claim 58 wherein a peak plasma density of the weakly-ionized plasma is less than about 10^{12} cm⁻³.

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