**8**. The method of claim **1** wherein the exit of said ion funnel is provided adjacent to a quadrupole lens element.

**9**. An apparatus for focusing dispersed charged particles comprising:

a) a plurality of elements contained within a region maintained at a pressure between $10^{-1}$ millibar and 1 bar, each of said elements having progressively larger apertures wherein said apertures form an ion funnel having an entry at the largest aperture and an exit at the smallest aperture and an RF voltage applied to each of the elements wherein the RF voltage applied to each element is out of phase with the RF voltage applied to the adjacent element(s).

**10**. The apparatus of claim **9** further comprising a mechanical means for directing charged particles through the ion funnel.

**11**. The apparatus of claim **10** wherein the mechanical means is selected from the group comprising a fan and a vacuum, or combinations thereof.

**12**. The apparatus of claim **9** further comprising a DC potential gradient across the plurality of elements.

**13**. The apparatus of claim **9** wherein the shape of said apertures are selected from the group comprising circular, oval, square, trapezoidal, and triangular.

**14**. The apparatus of claim **9** wherein ion funnel is incorporated to focus a dispersion of charged particles in a mass spectrometer.

**15**. The apparatus of claim **9** wherein ion funnel is incorporated to focus a dispersion of charged particles in an ion mobility analyzer.

**16**. The apparatus of claim **9** wherein ion funnel is incorporated to focus a dispersion of charged particles generated in a multi-inlet system.

**17**. The apparatus of claim **9** wherein the exit of said ion funnel is provided adjacent to a multipole lens element.

**18**. The apparatus of claim **9** wherein the exit of said ion funnel is provided adjacent to a quadrupole lens element.

**19**. A method of trapping charged particles comprising the steps of:

a) providing a plurality of elements within a region maintained at a pressure between $10^{-1}$ millibar and 1 bar, each of said elements having successively larger apertures wherein said apertures form an ion funnel having an entry at the largest aperture and an exit at the smallest aperture,

b) applying an RF voltage to each of the elements wherein the RF voltage applied to each element is out of phase with the RF voltage applied to the adjacent element(s),

c) providing a DC voltage at the exit of said ion funnel sufficient to capture said charged particles, and

d) directing a volume of gas containing said charged particles into the entry of said ion funnel, thereby capturing said charged particles in said ion funnel.

**20**. The method of claim **19** further comprising the step of reducing the DC voltage applied to the exit of said ion funnel, thereby releasing said charged particles captured in said ion funnel.

**21**. The method of claim **19** further comprising the steps of:

a) providing said ion funnel at an aperture separating two regions maintained at different pressures, said aperture being covered by a gate,

b) reducing the DC voltage applied to the exit of said ion funnel while simultaneously opening said gate, thereby releasing said charged particles captured in said ion funnel and directing said ions through said aperture.

**22**. The method of claim **19** wherein said volume of gas is drawn from the atmosphere and said charged particles are ambient ions found in the atmosphere.

**23**. An apparatus for focusing dispersed charged particles comprising:

a) two elements within a region maintained at a pressure between $10^{-1}$ millibar and 1 bar, placed adjacent to each other, each of said elements formed into a conical coil, said coils forming an ion funnel having an entry at the largest end and an exit at the smallest end, wherein an RF voltage is applied to each of the elements and said RF voltage applied to each element is 180 degrees out of phase with the RF voltage applied to the adjacent element.

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