## CLAIMS

1. A bipolar ionizer for air purification, wherein the bipolar ionizer is a plate-type structure comprising a substrate with a thermally conductive sheet, a porous emitter plate, a dielectric barrier plate, and a porous ground plate with ion extraction mechanism, all of which are stacked together in sequence, wherein the porous emitter plate includes a first emitter plate disposed above a top surface of the substrate and a second emitter plate disposed under a bottom surface of the substrate; the dielectric barrier plate includes a first dielectric barrier plate disposed above the first emitter plate, and a second dielectric barrier plate disposed under the second emitter plate; the porous ground plate includes a first ground plate disposed above the first dielectric barrier plate and a second ground plate disposed under the second dielectric barrier plate; the first emitter plate and the second emitter plate are both porous metal sheets; the first ground plate and the second ground plate are both porous metal sheets; an electric field gradient formed between the thermally conductive sheet and the first emitter plate is smaller than an electric field gradient formed between the first emitter plate and the first ground plate, and an electric field gradient formed between the thermally conductive sheet and the second emitter plate is smaller than an electric field gradient formed between the second emitter plate and the second ground plate.

2. The bipolar ionizer for air purification as recited in claim 1, wherein the thermally conductive sheet is located at the center of the substrate, and it uniformly divides the substrate into two upper and lower pieces; and the first dielectric barrier plate and the second dielectric barrier plate are of the same material and have the same thickness.

3. The bipolar ionizer for air purification as recited in claim 2, wherein both the first ground plate and the second ground plate have meshes regularly distributed in arrays.

4. The bipolar ionizer for air purification as recited in claim 2, wherein the first dielectric barrier plate and the second dielectric barrier plate are made of either high silica glass plates or modified ceramic plates.

5. The bipolar ionizer for air purification as recited in claim 3, wherein the first dielectric barrier plate and the second dielectric barrier plate are made of either high silica glass plates or modified ceramic plates.

6. The bipolar ionizer for air purification as recited in claim 2, wherein the thermally conductive sheet is an electric heating sheet.

7. The bipolar ionizer for air purification as recited in claim 3, wherein the thermally conductive sheet is an electric heating sheet.

8. The bipolar ionizer for air purification as recited in claim 7, wherein the periphery of the plate-type structure is provided with a sealing ring.

9. A diffuser, comprising a plurality of blades and a plurality of bipolar ionizers as recited in claim 3, wherein the plurality of the bipolar ionizers are respectively arranged in the same direction on the plurality of blades.