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Abstract

A device and method are provided for producing negatively charged nanoparticles. The device comprises a power supply, an electron supermicroemitter and a controller, the power supply connects with the electron supermicroemitter and the controller respectively. The potential of the electron supermicroemitter to the ground is controlled in the range of -2 kV to -29 kV by the power supply and the controller in accordance with the shape, size and different application of the materials of the emitter, so as to form field electron emitting of tunneling effect. The energy of electrons with high current density produced by the emitter can be adjusted during the electrons' colliding with particles in aerosol such that the electrons are attached to the nanoparticles of different size with wider energy band to form negatively charged nanoparticles.