

CLAIMS

What is claimed is:

1. A microfluidic chip system for generating droplets, comprising:

a droplet generation device for generating the droplets;

5 a power generation device for supplying a power to the droplet generation device,
the power generation device comprising a main body and a first limiting member, the first
limiting member exposed from the main body;

a collection bottle for collecting the droplets flowing out of the droplet generation device;

10 a connection device connecting the droplet generation device, the power generation device, and the collection bottle to each other, and

a preparation platform for fixing the droplet generation device, the power generation device, and the collection bottle, the preparation platform comprising a base, and a droplet generation device slot, a power generation device slot, and a first limiting slot
15 formed on the base, the droplet generation device and the power generation device respectively received in the droplet generation device slot and the power generation device slot, the first limiting slot configured to receive the first limiting member therein and keep the first limiting member at a predetermined location.

2. The microfluidic chip system of claim 1, wherein the droplet generation device comprises a chip body, the chip body defines a continuous phase inlet and a dispersed phase inlet, the continuous phase and the dispersed phase enter the chip body through the continuous phase inlet and the dispersed phase inlet.

5 3. The microfluidic chip system of claim 2, wherein the microfluidic chip system further comprises a continuous phase reservoir and a dispersed phase reservoir, the continuous phase reservoir and the dispersed phase reservoir are fixed on or disposed outside the chip body.

10 ~~4. The microfluidic chip system of claim 2, wherein the preparation platform comprises a base, and a droplet generation device slot and a power generation device slot formed on the base, the droplet generation device and the power generation device are respectively received in the droplet generation device slot and the power generation device slot.~~

~~45.~~ The microfluidic chip system of claim 24, wherein the base comprises the first portion and a second portion connected to the first portion, the first portion is lower than
15 the second portion, the droplet generation device is formed on the first portion, and the power generation device is formed on the second portion.

~~56.~~ The microfluidic chip system of claim 24, wherein the collection bottle is disposed outside the droplet generation device, the base further defines a collection bottle slot, and the collection bottle is fixedly received in the collection bottle slot.

67. The microfluidic chip system of claim 24, wherein the collection bottle is fixedly received in the chip body, and the chip body is fixedly received in the droplet generation device slot.

78. The microfluidic chip system of claim 24, wherein the microfluidic chip system further comprises at least one vibration device, the vibration device is received in the droplet generation device slot and corresponds to the dispersed phase inlet, and the vibration device is configured to apply vibration to the dispersed phase.

89. The microfluidic chip system of claim 2, wherein the microfluidic chip system also comprises at least one vibration device, the vibration device is disposed on the chip body and corresponds to the dispersed phase inlet, and the vibration device is configured to apply vibration to the dispersed phase.

910. The microfluidic chip system of claim 12, wherein the power generation device further comprises an operation portion, and a first limiting member is formed on an end of the operation portion, the preparation platform further comprises a first limiting slot, the first limiting slot is configured to receive the first limiting member therein, to keep the operation portion at a predetermined location.

101. The microfluidic chip system of claim 910, wherein the power generation device is an injection device.

1112. The microfluidic chip system of any one of claims 1-101, wherein the power

generation device is a negative pressure generation device, and the negative pressure generation device connects to the collection bottle through the connection device.

1213. The microfluidic chip system of claim 1142, wherein the preparation platform further comprises a fixing seat and a dustproof cover rotatably connected to the fixing seat, the dustproof cover is disposed on one side of the droplet generation device, and the dustproof cover is configured to prevent dust from entering the droplet generation device.

1314. The microfluidic chip system of ~~any one of claims 2-11~~, wherein the power generation device is a positive pressure generation device, and the positive pressure generation device connects to the continuous phase inlet and the dispersed phase inlet through the connection device.

145. A method for preparing droplets using the microfluidic chip system of any one of claims 2-1014, comprising:

measuring predetermined amounts of continuous phase and dispersed phase through a pipette gun or a pipette tube, injecting the measured continuous phase into the continuous phase inlet, and injecting the measured dispersed phase into the dispersed phase inlet; and

activating the power generation device to form a pressure difference between the pressure in the collection bottle, the connection device, and the chip body, wherein the pressure difference promotes the dispersed phase and the continuous phase to converge

and flow into the collection bottle in the form of droplets.

1546. The method for preparing droplets of claim ~~1415~~, wherein before ~~activating~~^{stating} the power generation device, the method further comprises:

applying vibration to the dispersed phase by at least one vibration device.