## CLAIMS

1. A droplet generation method, adopting a droplet generation device and a droplet receiver, wherein, a first liquid is placed in the droplet receiver, wherein the droplet generation device comprises a fluid passage, an accommodating cavity with a volume which is variable and a droplet generation tube having a first port and a second port that are relatively distant from each other, wherein the first port is in liquid communication with the accommodating cavity, and an inner diameter of the second port of the droplet generation tube is greater than 0.2 mm; the droplet generation method comprises following steps:

S1, transferring a second liquid into the droplet generation tube, wherein the second liquid is a liquid immiscible with the first liquid;

S2, inserting the droplet generation tube into the first liquid, and keeping the second port of the droplet generation tube being below a liquid surface of the first liquid;

S3, having the droplet generation tube and the droplet receiver remain stationary with respect to each other, controlling the accommodating cavity to make the volume of the accommodating cavity being subject to a periodic change, and injecting a driving fluid into the fluid passage to drive the second liquid to move, to obtain droplets of the second liquid; wherein the periodic change is a compression-recovery reciprocating change, or an expansion-recovery reciprocating change, or a compression-recovery-expansion-recovery reciprocating change;

wherein at least a part of a wall constituting the accommodating cavity is a movable part, a vibration mechanism is connected with the movable part, to subject the periodic change by making the movable part vibrate.

2. The droplet generation method according to claim 1, wherein, in step S3, droplets are formed in the droplet generation tube, and then flow out through the second port and enter the droplet receiver.

3. The droplet generation method according to claim 1, wherein,

in step S3, the accommodating cavity, the droplet generation tube, and the droplet receiver are arranged in sequence from top to bottom, the first port of the droplet generation tube is communicated with the bottom of the accommodating cavity, and a center line of the accommodating cavity, an axial line of the droplet generation tube, a center line of the first port,

and a center line of the second port are coincident and extend in a vertical direction.

4. The droplet generation method according to claim 1, wherein, the inner diameter of the second port is 0.2 to 1 mm, preferably 0.3 mm to 1 mm, more preferably 0.3 mm to 0.6 mm; and/or,

the inner diameter of the first port is larger than the inner diameter of the second port; and/or,

the droplet generation tube comprises a tapered tube portion, and two ends of the tapered tube portion respectively form the first port and the second port, the taper of the tapered tube portion is 0.05 to 0.2; and/or,

the frequency of the periodic change is 10 Hz to 1 KHz, preferably 50 Hz to 600 Hz, further preferably 80 Hz to 600 Hz, more preferably 100 Hz to 600 Hz, more preferably 150 Hz to 600 Hz, still more preferably 150 Hz to 500 Hz, particularly preferably 150 Hz to 300 Hz.

5. The droplet generation method according to claim 1, wherein, the movable part is composed of a metal or non-metal diaphragm; and/or, one or more of the top or the surrounding side walls of the accommodating cavity are provided with the movable part.

6. The droplet generation method according to claim 1, wherein, the movable part is connected with the vibration mechanism through a connecting mechanism, and in step S3, the vibration mechanism drives the movable part to vibrate reciprocally and synchronously to control the volume of the accommodating cavity to change periodically; or,

a vibrating mechanism is set abut against the movable part, and in step S3, the vibrating mechanism transmit its reciprocating vibration to the movable part to make it vibrate, so as to control the volume of the accommodating cavity to change periodically.

7. The droplet generation method according to claim 6, wherein, a direction of the reciprocating vibration is an up-down direction; and/or

the vibration amplitude is 5 μm to 1000 μm, preferably 5 μm to 600 μm, more preferably 5 μm to 300 μm, further preferably 5 μm to 100 μm, more further preferably 5 μm to 60 μm; and/or

when the taper of the tapered tube portion is 0.05 to 0.1, setting the vibration frequency to be 100 Hz to 600 Hz, and the vibration amplitude to be 10 μm to 300 μm; when the taper of the tapered tube portion is 0.1 to 0.2, setting the vibration frequency to be 100 to 300 Hz, and the vibration amplitude to be 10 μm to 600 μm; and/or

in step S3, the fluid is a liquid, and the injection speed is 2 to 200 μL/min, preferably 10 to 50 μL/min; and/or

the accommodating cavity is an annular cavity with an inner diameter of 4 to 6 mm; and/or, an inner peripheral side wall of the accommodating cavity extends in a vertical direction; and/or

the step S1 is performed before the step S2, or the step S1 is performed after the step S2; and/or

in step S1, the second liquid is sucked into the droplet generation tube through the second port of the droplet generation tube, which is followed or not followed by sucking some of the first liquid; and/or

before step S3, the liquid in the droplet generation tube has a section of driving fluid and a section of second liquid in sequence from top to bottom; or, the liquid in the droplet generation tube has a section of driving fluid, a section of second liquid and a section of first liquid in sequence from top to bottom.

8. The droplet generation method according to claim 1, wherein, the droplet generation method comprises a step of cleaning and/or eliminating bubbles of the accommodating cavity and the droplet generation tube after the droplet generation is completed or before the next droplet generation starts;

preferably, two plunger pumps are adopted with different volumes to control the driving fluid, combining with a three-way valve for switching control, wherein the plunger pump with a larger volume is used in the step of cleaning and/or step of eliminating bubbles, and the plunger pump with a smaller volume is used in the step of droplet formation.

9. The droplet generation method according to claim 1, wherein, the first liquid is a continuous phase, and the second liquid is a dispersed phase; and/or, the first liquid is an oil phase, and the second liquid is an aqueous phase; and/or

the first liquid is added with a surfactant; the second liquid is an aqueous phase containing biological or chemical substances to be detected; and/or

the droplets are digital PCR droplets or single-cell droplets; and/or, a diameter of the droplets is 50 μm to 250 μm, preferably 200 μm or less, more preferably 150 μm or less, further preferably 120 μm or less, still more preferably 110 μm or less.