CLAIMS

[Claim 1]

A microreactor system comprising:

a microreactor that has two inlets into which fluids are introduced and a channel merging the fluids, and mixes, in the channel, wherein

a channel volume of the channel from the inlets to a junction where the fluids are merged is asymmetrical between the fluids;

a first fluid introduced from a first inlet of the inlets and a second fluid introduced from a second inlet of the inlets;

a first pump that sends the first fluid toward the inlets;

a second pump that sends the second fluid toward the inlets;

a first fluid detector that detects an arrival of the first fluid at the first inlet; and

a second fluid detector that detects an arrival of the second fluid at the second inlet,

wherein the first pump, after starting a transfer of the first fluid toward the first inlet, stops the transfer by detection by the first fluid detector,

the second pump, after starting a transfer of the second fluid toward the second inlet, stops the transfer by

detection by the second fluid detector,

each of the first pump and the second pump resumes the transfer after the transfer of the first fluid is stopped and after the transfer of the second fluid is stopped, and

the first fluid of which transfer has been temporarily stopped and the second fluid of which transfer has been temporarily stopped are introduced into the microreactor and mixed.

[Claim 2]

A microreactor system comprising:

a microreactor that has two inlets into which fluids are introduced and a channel merging the fluids, and mixes, in the channel, wherein

a channel volume of the channel from the inlets to a junction where the fluids are merged is asymmetrical between the fluids;

a first fluid introduced from a first inlet of the inlets and a second fluid introduced from a second inlet of the inlets;

a first pump that sends the first fluid toward the first inlet;

a second pump that sends the second fluid toward the second inlet;

a first fluid detector that detects an arrival of the first fluid at the inlets; and

a second fluid detector that detects an arrival of the second fluid at the inlets,

wherein the second pump, after starting a transfer of the second fluid toward the second inlet, stops the transfer by detection by the second fluid detector,

the first pump transfers the first fluid toward the first inlet,

the second pump resumes the transfer after the transfer of the second fluid is stopped and after detection by the first fluid detector, and

the first fluid being transferred and the second fluid of which transfer has been temporarily stopped are introduced into the microreactor and mixed.

[Claim 3]

A microreactor system comprising:

a first-stage microreactor that has two inlets into which fluids are introduced and a channel merging the fluids, and mixes, in the channel, wherein

a channel volume of the channel from the inlets to a junction where the fluids are merged is asymmetrical between the fluids;

a first-stage first fluid introduced from a first inlet of the inlets and a first-stage second fluid introduced from a second inlet of the inlets;

a plurality of microreactors in subsequent stages that

are disposed in series downstream of the first-stage microreactor, the microreactors in subsequent stages each having two inlets into which a fluid is introduced and a channel that merges the fluid, and mixes, in the channel, a mixed fluid introduced from the first inlet and a fluid to be mixed introduced from the second inlet, the mixed fluid being generated in a microreactor in a preceding stage;

a first-stage first fluid pump that sends the first-stage first fluid toward the first inlet of the first-stage microreactor;

a first-stage second fluid pump that sends the first-stage second fluid toward the second inlet of the first-stage microreactor;

a plurality of pumps for the fluid to be mixed that are disposed in each of the microreactors in the subsequent stages and send the fluid to be mixed toward each of the second inlets of the microreactors in the subsequent stages;

a fluid detector for the first-stage first fluid that detects an arrival of the first-stage first fluid at the first inlet of the first-stage microreactor;

a fluid detector for the first-stage second fluid that detects an arrival of the first-stage second fluid at the second inlet of the first-stage microreactor;

a plurality of fluid detectors for a mixed fluid that are disposed in each of the microreactors in the subsequent

stages and detect an arrival of the mixed fluid generated in the preceding microreactor at each of the first inlets of the microreactors in the subsequent stages; and

a plurality of fluid detectors for the fluid to be mixed that are disposed in each of the microreactors in the subsequent stages and detect an arrival of the fluid to be mixed at each of the second inlets of the microreactors in the subsequent stages,

wherein the first-stage first fluid pump, after starting a transfer of the first-stage first fluid toward the first inlet of the first-stage microreactor, stops the transfer by detection by the fluid detector for the first-stage first fluid,

the first-stage second fluid pump, after starting a transfer of the first-stage second fluid toward the second inlet of the first-stage microreactor, stops the transfer by detection by the fluid detector for the first-stage second fluid,

each of the pumps for the fluid to be mixed, after starting a transfer of the fluid to be mixed toward each of the second inlets of the microreactors in the subsequent stages, stops the transfer by detection by the fluid detector for the fluid to be mixed,

each of the first-stage first fluid pump and the first-stage second fluid pump resumes the transfer after the

detection by the fluid detector for the first-stage first fluid and after the detection by the fluid detector for the first-stage second fluid,

the first-stage first fluid of which transfer has been temporarily stopped and the first-stage second fluid of which transfer has been temporarily stopped are introduced into the first-stage microreactor and mixed,

the pump for the fluid to be mixed resumes the transfer after the transfer of the fluid to be mixed is stopped and after the detection by the fluid detector for the mixed fluid,

the mixed fluid generated in the microreactor in the preceding stage and the fluid to be mixed of which transfer has been temporarily stopped are introduced into the microreactors in the subsequent stages and mixed, and

the mixed fluid and the fluid to be mixed are sequentially mixed in the microreactors in the subsequent stages.

[Claim 4]

The microreactor system according to any one of claims 1 to 3, comprising a valve capable of opening and closing a channel at each of the inlets of the microreactor.

[Claim 5]

The microreactor system according to any one of claims 1 to 3, wherein a recovery path that recovers the mixed fluid and a disposal path that discards the fluid are branched and

connected downstream of the microreactor.

[Claim 6]

The microreactor system according to any one of claims 1 to 3, wherein each of the microreactors includes a leak detector that detects a fluid leak.

[Claim 7]

The microreactor system according to any one of claims 1 to 3, wherein each of the pumps includes a leak detector that detects a fluid leak.

[Claim 8]

The microreactor system according to any one of claims 1 to 3, comprising:

a first weight detector that detects a change in weight of each of the fluids introduced into the microreactor, and

a second weight detector that detects a change in weight of the fluid recovered from the microreactor.

[Claim 9]

The microreactor system according to any one of claims 1 to 3, wherein the microreactor includes a temperature controller that controls a temperature of the microreactor.

[Claim 10]

The microreactor system according to any one of claims 1 to 3, comprising a fluid temperature controller that controls a temperature of the fluid mixed in the microreactor, downstream of the microreactor.

[Claim 11]

The microreactor system according to any one of claims 1 to 3, wherein

the first fluid is a fluid that is mixed at a relatively higher flow rate than the second fluid, and

a channel volume of the channel through which the first fluid flows is larger than a channel volume of the channel through which the second fluid flows.