μL/min in a fine channel device having a minimum distance of 400 μm between adjacent partition walls in a flowing direction and having the fine channel in which one side of the fine channel was modified to have hydrophobic properties. Water was supplied from an inlet port A **28** and cyclohexane was supplied from an inlet port B **29** under the above-mentioned flow rate condition, and an amount of cyclohexane in which an amount of water was contaminated discharged from an outlet port C **30** and an amount of water in which an amount of cyclohexane was contaminated discharged from an outlet port D **31** were measured by a graduated cylinder respectively. Table 3 shows a result.

TABLE 3

Flow rate (μL/min) Distance between adjacent partition walls (μm)	3	5	8	10	20	50
Contamination percentage of organic phase to aqueous phase (%)						
400 (no surface modification)	41.7	27.6	0.0	0.0	0.0	0.0
400 (surface modification)	0.0	0.0	4.1	0.0	0.0	0.0
Contamination percentage of aqueous phase to organic phase (%)						
400 (no surface modification)	33.6	14.3	3.1	3.7	0.0	9.1
400 (surface modification)	1.4	0.7	0.6	1.1	1.3	7.4

[0147] Table 3 shows contamination percentages of fluid: a contamination percentage (%) of an organic phase to an aqueous phase and a contamination percentage (%) of an aqueous phase to an organic phase, at flow rates of 3, 5, 8, 10, 20 and 50 μL/min when both the aqueous phase and the organic phase are supplied under the same flow rate condition.

[0148] In the result shown in Table 3, contamination percentages decreased to less than 8% in the flow rate condition at a contamination percentage of less than 10% using the partition wall distance of 400 μm in Example 1.

[0149] Into a fine channel device having a minimum distance of 200 μm between adjacent partition walls in a flowing direction of fluid and having the fine channel in which one side of the fine channel was subjected to a hydrophobic treatment, cyclohexane was supplied at a fixed flow rate of 8 μL/min, and water was supplied by changing the flow rate in a range of from 3 μL/min to 20 μL/min. Namely, water was supplied from the inlet port A **28** and cyclohexane was supplied from the inlet port B **29** under the above-mentioned flow rate condition so that a ratio of the flow rate of water to that of cyclohexane was in a range of from 0.375 to 2.5, and an amount of cyclohexane in which an amount of water was contaminated discharged from the outlet port C **30** and an amount of water in which an amount of cyclohexane was contaminated discharged from the outlet port D **31** were measured by a graduated cylinder respectively. Table 4 shows a result.

TABLE 4

Flow rate ratio Distance between adjacent partition walls (μm)	0.375	0.625	1.000	1.250	2.500
Contamination percentage of organic phase to aqueous phase (%)					
200 (no surface modification)	1.7	2.7	0.0	5.4	4.2
200 (surface modification)	7.8	0.0	4.1	0.0	0.0
Contamination percentage of aqueous phase to organic phase (%)					
200 (no surface modification)	0.5	0.7	9.6	8.7	54.3
200 (surface modification)	0.0	0.0	0.6	1.3	16.3

[0150] Table 4 shows contamination percentages of fluid: a contamination percentage (%) of an organic phase to an aqueous phase and a contamination percentage (%) of an aqueous phase to an organic phase, at flow rate ratios of 0.375, 0.625, 1.000, 1.250 and 2.500 respectively.

[0151] As a result, contamination percentages decreased to less than 8% in the flow rate condition at a contamination percentage of less than 10% using the partition wall distance of 200 μm in Example 2.

Example 4

[0152] In Example 4, a fine channel device having the construction as shown in **FIG. 6**(*b*) was used. In a fine channel **19** formed in the fine channel device, a branch portion branched into two fine channel portions in a Y-letter like form was formed at each side of fluid inlet and outlet ports. **FIG. 21** shows the inner structure of the fine channel used in this Example. **FIG. 21**(*a*) is a SEM photograph taking the fine channel used in this Example from an upper side and **FIG. 21**(*b*) is a conceptual diagram showing the inner structure of the fine channel. The width of the fine channel was 240 μm, the depth was 60 μm and the length was 30 mm, and a large number of projections **20** of 30 μm long were formed at one side of the fine channel at sides of the inlet port A and the outlet port C. In a substantially central portion of the fine channel, partition walls **22** having the maximum length of 50 μm and a height of 60 μm were formed intermittently in a flowing direction of fluid with intervals of 50 μm.

[0153] In the same manner as Example 1, the fine channel **19** was formed in a Pyrex (trademark) glass substrate **32** having a size of 70 mm×38 mm×1 mm (thick) according to conventional photolithographic and wet etching techniques, and a cover member **34** comprising a Pyrex (trademark) glass substrate having the same size as the fine channel substrate in which penetration holes **35** having a diameter of 0.6 mm were formed mechanically at positions corresponding to inlet ports A **28**, B **29** and outlet ports C **30**, D **31**, was prepared. The cover member was thermally bonded on the fine channel substrate to seal hermitically the fine channel.

[0154] Methylation of ethylenediamine by iodomethane was conducted by using the fine channel device. Namely, an