Claims

1. A counter-current liquid-liquid extraction process, for a liquid-liquid extraction system (1) adapted for the flow of two or more liquids therein comprising:

(i) a mixer settler sub-system (100) comprising:

one or more mixer settlers (110) connected in series,

a first inlet (111) for a first liquid feed stream (121),
a second inlet (112) for a second liquid feed stream (122),

a first outlet (131) for a first product stream (141),
a second outlet (132) for a first byproduct stream (142),

(ii) a counter-current liquid-liquid extraction column (200) and comprising within one common vessel (210):

a first inlet (221) for a third liquid feed stream (231),
a second inlet (222) for a fourth liquid feed stream (232),

a first outlet (241) for a second product stream (251),
a second outlet (242) for a second byproduct stream (252),

either a mixing section (260) comprising an agitation means (261) and/or a static section (280) comprising an internal (281),

wherein the first outlet (131) of the mixer settler sub-system(100) is in fluid communication with the first inlet (221) of the column (200),

wherein the second inlet (112) of the mixer settler sub-system (100) is in fluid

communication with the second inlet (222) of the counter-current liquid-liquid extraction column (200),

in which the process comprises:

a first liquid feed stream (121) is fed by means of the first inlet (111) and a second liquid feed stream (122) is fed by means of the second inlet (112),

liquid-liquid contact occurs between the stream (121) and the stream (122) within the mixer settler sub-system (100) to form a first product stream (141) and a first byproduct stream (142),

and the first product stream (141) is removed by means of the first outlet (131), and the first byproduct stream (142) is removed by means of the second outlet (132),

the first product stream (141) is fed as a third liquid feed stream (231) to the column (200) by means of the first inlet (221) and a fourth liquid feed stream (232) is fed by means of the second inlet (222),

liquid-liquid contact occurs between the stream (231) and the stream (232) within the column (200) to form a second product stream (251) and a second byproduct stream (252),

and the second product stream (251) is removed by means of the first outlet (241), and the second byproduct stream (252) is removed by means of the second outlet (242),

wherein the second liquid feed stream (122) to the mixer settler sub-system (100) is in fluid communication with the fourth liquid feed stream (232) to the column (200), and

wherein one each of the pairs of streams (121) and (122), (141) and (142), (231) and (232), and (251) and (252) comprises one or more organic compounds, preferably two or more organic compounds, most preferably consists essentially of organic compounds, and the other stream in each of the pairs comprises water, preferably consists essentially of water.