

channel distillation unit **840** through line **841**. The remainder of the product mixture flows through line **842** to microchannel distillation unit **850**. In microchannel distillation unit **850** ethane and ethylene are separated from the product mixture and flow from microchannel distillation unit **850** through line **851**. The remaining product comprises methane which flows from microchannel distillation unit **850** through line **852**. The raw natural gas product mixture flowing through line **809** to bulk liquids separator **810** may be at a pressure of about 10 to about 5000 psig, and in one embodiment about 10 to about 2500 psig; and a temperature of about -250 to about 500° C., and in one embodiment about -50 to about 300° C. The product mixture flowing through line **811** to microchannel distillation unit **820** may be at a pressure of about 10 to about 5000 psig, and in one embodiment about 10 to about 2500 psig; and a temperature of about -250 to about 500° C., and in one embodiment about -50 to about 300° C. The product mixture flowing through line **822** to microchannel distillation unit **830** may be at a pressure of about 10 to about 5000 psig, and in one embodiment about 10 to about 2500 psig; and a temperature of about -250 to about 500° C., and in one embodiment about -200 to about 300° C. The product mixture flowing through line **832** to microchannel distillation unit **840** may be at a pressure of about 10 to about 5000 psig, and in one embodiment about 10 to about 2500 psig; and a temperature of about -225 to about 500° C., and in one embodiment about -200 to about 300° C. The product mixture flowing through line **842** to microchannel distillation unit **850** may be at a pressure of about 10 to about 5000 psig, and in one embodiment about 10 to about 2500 psig; and a temperature of about -245 to about 500° C., and in one embodiment about -200 to about 300° C. The methane flowing from microchannel distillation unit **850** through line **852** may be at a pressure of about 10 to about 5000 psig, and in one embodiment about 10 to about 2500 psig; and a temperature of about -245 to about 300° C., and in one embodiment about -200 to about 300° C.

[0114] The refrigerant used in the separation system **800** illustrated in FIG. 19 may be any refrigerant. The refrigerant flows through line **859** to condenser **860**, through condenser **860** to line **861**, through line **861** to compressor **865**, through compressor **865** to line **866**, through line **866** to valve **870**, through valve **870** to line **871**, through line **871** to expansion device **875**, through expansion device **875** to line **876**, through line **876** to microchannel distillation unit **850**, through heat exchanger **850** to line **877**, through line **877** to expansion device **880**, through expansion device **880** to line **881**, through line **881** to microchannel distillation unit **840**, through microchannel distillation unit **840** to line **882**, through line **882** to expansion device **885**, through expansion device **885** to line **886**, through line **886** to microchannel distillation unit **830**, through microchannel distillation unit **830** to line **887**, through line **887** to expansion device **890**, through expansion device **890** to line **891**, through line **891** to microchannel distillation unit **820**, through microchannel distillation unit **820** to line **859**, and through line **859** back to condenser **860** where the cycle starts all over again. The refrigerant flowing through line **859** from microchannel distillation unit **820** to condenser **860** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line

861 from condenser **860** to compressor **865** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **866** from compressor **865** to valve **870** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **871** from valve **870** to expansion device **875** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **876** from expansion device **875** to microchannel distillation unit **850** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **877** from microchannel distillation unit **850** to expansion device **880** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **881** from expansion device **880** to microchannel distillation unit **840** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **882** from microchannel distillation unit **840** to expansion device **885**, may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **886** from expansion device **885** to microchannel distillation unit **830** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **887** from microchannel distillation unit **830** to expansion device **890** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C. The refrigerant flowing through line **891** from expansion device **890** to microchannel distillation unit **820** may be at a pressure of about 10 to about 3000 psig, and in one embodiment about 20 to about 2500 psig; and a temperature of about -250 to about 300° C., and in one embodiment about -225 to about 300° C.

[0115] While the invention has been explained in reaction to specific embodiments, it is to be understood that various modifications thereof will become apparent to those skilled in the art upon reading the specification. Therefore, it is to be understood that the invention disclosed herein is intended to cover such modifications as fall within the scope of the appended claims.

1. A process for distilling a fluid mixture in a microchannel distillation unit, the microchannel distillation unit comprising a plurality of microchannel distillation sections, the