CLAIMS

1. A mass transfer assembly for use in an open internal region within a mass transfer column, the mass transfer assembly comprising:

a dividing wall forming first and second sub-regions on opposite sides of the dividing wall;

one or more zones of mass transfer structures positioned in the sub-regions on the opposite sides of the dividing wall; and

a vapor flow restrictor positioned in the first sub-region and moveable between a first orientation that causes a first vapor flow resistance through the first sub-region and a second orientation that causes a second vapor flow resistance through the sub-region that is greater than the first vapor flow resistance to allow an adjustment of a volumetric split of vapor when ascending through the first and second sub-regions on the opposite sides of the dividing wall,

wherein the vapor flow restrictor comprises a tray having a tray deck and vapor flow apertures in the tray deck, and wherein when the tray is in the first orientation a total open area of the vapor flow apertures is less than the total open area of the vapor flow apertures when the tray is in the second orientation.

2. The mass transfer assembly of claim 1, wherein the first vapor flow resistance through the first sub-region is less than or the same as a vapor flow resistance through the second sub-region on the opposite side of the dividing wall and the second vapor flow resistance is greater than the vapor flow resistance through the second sub-region on the opposite side of the dividing wall.

3. The mass transfer assembly of claim 2, wherein the vapor flow restrictor further comprises an outlet weir, and wherein when the cross-flow tray is in the first orientation the outlet weir extends to a first height above the tray deck and when the cross-flow tray is in the second orientation the outlet weir extends to a second height above the tray deck that is greater than the first height.

4. The mass transfer assembly of claim 3, wherein the vapor flow restrictor further comprises an actuator associated with the outlet weir for moving the outlet weir between the first and second heights.

5. The mass transfer assembly of claim 4, wherein the outlet weir is pivotably mounted and said actuator is operably coupled with the outlet weir for causing the outlet weir to pivot between the first and second heights above the tray deck.

6. The mass transfer assembly of claim 1, wherein the vapor flow restrictor further a comprises a restrictor plate that is moveable to vary the total open area of the vapor flow apertures and an actuator associated with the restrictor plate for controlling movement of the restrictor plate.

7. The mass transfer assembly of claim 6, wherein the restrictor plate is slidably mounted beneath the tray deck of the tray and said actuator is operably coupled with the restrictor plate for causing the sliding movement of the restrictor plate.

8. The mass transfer assembly of claim 7, wherein said tray is a cross-flow tray.

9. The mass transfer assembly of claim 7, wherein said tray is a chimney tray and at least one of the zones of mass transfer structures on said first side of the dividing wall comprises packing.

10. The mass transfer assembly of claim 1, including another one of the dividing walls, wherein the dividing walls are positioned in horizontally spaced-apart and parallel relationship to each other.

11. A mass transfer column comprising:

a shell;

an open internal region defined by said shell; and

a mass transfer assembly of claim 1 positioned within said open internal region.

12. The mass transfer column of claim 11, wherein the first vapor flow resistance through the first sub-region is less than or the same as a vapor flow resistance through the second sub-region on the opposite side of the dividing wall and the second vapor flow resistance is greater than the vapor flow resistance through the second sub-region on the opposite side of the dividing wall.

13. The mass transfer column of claim 12, wherein the vapor flow restrictor further comprises an actuator operably associated with the outlet weir, wherein when the cross-flow tray is in the first orientation the outlet weir extends to a first height above the tray deck and when the cross-flow tray is in the second orientation the outlet weir extends to a second height above the tray deck that is greater than the first height, and wherein the actuator is a linear or rotary actuator and is operable to move the outlet weir between the first and second heights.

14. The mass transfer column of claim 12, wherein the vapor flow restrictor further comprises a restrictor plate that is moveable to vary the total open area of the vapor flow apertures, and an actuator associated with the restrictor plate for controlling movement of the restrictor plate, wherein when the tray is in the first orientation the actuator positions the restrictor plate so that the total open area of the vapor flow apertures is less than the total open area of the vapor flow apertures when the tray is in the second orientation and the actuator repositions the restrictor plate.

15. The mass transfer column of claim 14, wherein the restrictor plate is slidably mounted beneath the tray deck of the tray and said actuator is a linear or rotary actuator and is operably coupled with the restrictor plate for causing the sliding movement of the restrictor plate.

16. The mass transfer column of claim 15, wherein said tray is a cross-flow tray or a chimney tray.

17. The mass transfer column of claim 15, wherein when said tray is a cross-flow tray at least one of the zones of mass transfer structures on said first side of the dividing wall comprises cross-flow trays and when said tray is a chimney tray at least one of the zones of mass transfer structures on said first side of the dividing wall comprises packing.

18. The mass transfer column of claim 11, including another one of the dividing walls, wherein the dividing walls are positioned in horizontally spaced-apart and parallel relationship to each other.

19. A method of operating mass transfer column comprising a shell, an open internal region defined by the shell, and a mass transfer assembly of claim 1 positioned within said open internal region, said method comprising the steps of:

operating an actuator to move the vapor flow restrictor positioned in the first sub-region between a first orientation that causes a first vapor flow resistance through the first sub-region and a second orientation that causes a second vapor flow resistance through the sub-region that is greater than the first vapor flow resistance to adjust a volumetric split of vapor when ascending through the first and second sub-regions on the opposite sides of the dividing wall;

introducing a feedstream into the open internal region;

processing the feedstream to cause vapor to ascend through the first and second sub-regions; and

withdrawing a product or product from the mass transfer column.