We claim:

1. A process for producing acetic acid, the process comprising:

carbonylating, in a reactor, at least one of methanol, dimethyl ether, and methyl acetate in a reaction medium comprising a metal catalyst, methyl iodide, an iodide salt, and optionally acetic acid and a finite amount water, to form a crude acetic acid product comprising acetic acid, optionally venting from the reactor a reactor vent stream comprising hydrogen iodide;

flashing the crude acetic acid product, with or without heat, to form a first vapor stream comprising acetic acid and methyl iodide and a first liquid residue stream comprising metal catalyst and halide salt, optionally condensing a portion of the first vapor stream to form a condensed flasher return stream and a flasher vent stream comprising hydrogen iodide;

separating, in a light ends column, the flashed vapor stream to form a second vapor stream comprising methyl iodide and hydrogen iodide, a side draw comprising purified acetic acid product, and a second liquid residue stream;

feeding to an absorber tower an absorber tower feed comprising at least a portion of at least one of the reactor vent stream, the flasher vent stream, and the second vapor stream;

contacting the absorber tower feed with a first absorbent comprising acetic acid to absorb methyl iodide and to form a first extract comprising the first absorbent and the absorbed methyl iodide;

conveying the first extract, directly or indirectly, to the light ends column and/or drying column;

terminating the supply of first absorbent to the absorber tower;

contacting the absorber tower feed with a second absorbent comprising methanol and/or methyl acetate to absorb methyl iodide and hydrogen iodide and to form a second extract comprising the second absorbent and the absorbed methyl iodide;

conveying the second extract, directly or indirectly, to the reactor.

2. The process of claim 1, wherein the second absorbent consists essentially of methanol.

3. The process of claim 1, further comprising the step of chilling the first absorbent prior to the contacting.

4. The process of claim 1, further comprising the step of chilling the second absorbent prior to the contacting.

5. The process of claim 1, further comprising mixing the second absorber return stream with methanol or a reactive derivative thereof prior to the conveying.

6. The process of claim 1, wherein the absorber tower feed comprises methyl acetate and the first and second absorbents absorb methyl acetate from the absorber tower feed.

7. The process of claim 1, wherein the process does not employ a stripper column to treat the first absorbent and/or the second absorbent.

8. The process of claim 1, wherein the carbonylating is conducted while maintaining the reaction system at concentrations of 2 to 25% by weight iodide salt, 1 to 20% by weight methyl iodide, 0.1 to 30% by weight methyl acetate, and 0.1 to 10% by weight water.

9. The process of claim 1, wherein the second absorber return stream is not returned to the separation zone.

10. The process of claim 1, wherein the contacting of the absorber tower feed with the methanol or methyl acetate in the second absorbent forms methyl iodide.

11. The process of claim 1, wherein the conveying of the second absorber return stream comprises

conveying the second absorber return stream to the reactor during a transition period; and

following the transition period, continuing to feed the second absorber return stream to the reactor.

12. The process of claim 1, wherein the conveying of the second absorber return stream comprises

conveying the second absorber return stream to the reactor after the termination of the supply of first absorbent.

13. The process of claim 1, wherein the second vapor stream further comprises volatile components.

14. The process of claim 1, wherein the flashing comprises condensing at least a portion of the first vapor stream to form the condensed flasher return stream and the flasher vent vapor stream comprising hydrogen iodide and directing the flasher vent vapor stream to the absorber tower.

15. The process of claim 1, wherein the carbonylating comprises venting a reactor vent stream comprising hydrogen iodide and directing at least a portion of the reactor vent stream to the absorber tower.

16. The process of claim 1, wherein the carbonylating comprises condensing at least a portion of the reactor vent stream to form a condensed reactor return stream and a reactor vent vapor stream comprising hydrogen iodide and directing the reactor vent vapor stream to the absorber tower.

17. The process of claim 1, wherein the second vapor stream is decanted to form a decanter vent stream comprising hydrogen iodide and the at least a portion of the second vapor stream comprises the decanter vent stream.

18. The process of claim 1, wherein the separating further comprises condensing at least a portion of the second vapor stream to form a condensed light ends return stream and a light ends vent vapor stream comprising hydrogen iodide and directing the light ends vent vapor stream to the absorber tower.

19. A process for operating an absorber tower in a carbonylation process, the process comprising:

carbonylating, in a reactor, at least one of methanol, dimethyl ether, and methyl acetate in a reaction medium comprising a metal catalyst, methyl iodide, an iodide salt, and optionally acetic acid and a finite amount water, to form a crude acetic acid product comprising acetic acid, optionally venting from the reactor a reactor vent stream comprising hydrogen iodide;

flashing the crude acetic acid product, with or without heat, to form a first vapor stream comprising acetic acid and methyl iodide and a first liquid residue stream comprising metal catalyst and halide salt, optionally condensing at least a portion of the first vapor stream to form a condensed flasher return stream and a flasher vent stream comprising hydrogen iodide;

separating, in a light ends column, the flashed vapor stream to form a second vapor stream comprising methyl iodide and hydrogen iodide, a side draw comprising purified acetic acid product, and a second liquid residue stream;

feeding to an absorber tower at least a portion of at least one of the reactor vent stream, the flasher vent stream, and the second vapor stream to initiate a start-up period,

during the start-up period, contacting the absorber tower feed with a first absorbent comprising acetic acid to absorb methyl iodide and to form a first absorber return stream comprising the first absorbent and the absorbed methyl iodide;

conveying the first absorber return stream to the light ends column and/or drying column;

transitioning from start up to steady operation during a changeover period by terminating the supply of first absorbent to the absorber tower ;

providing to the absorber tower a second absorbent comprising methanol and/or methyl acetate,

wherein, during at least a portion of the changeover period, acetic acid, methanol and methyl iodide are provided to the absorber tower;

forming a combined absorber return stream comprising acetic acid, methanol, and methyl iodide;

conveying the combined absorber return stream from the absorber tower to the reactor initiating steady state operation after the changeover period,

during steady state operation, contacting the second vapor stream with a second absorbent comprising methanol and/or methyl acetate to absorb methyl iodide and hydrogen iodide and to form a second absorber return stream comprising the second absorbent and the absorbed methyl iodide;

during the steady state operation, mixing the second absorber return stream with methanol or a reactive derivative thereof to form a mixed stream; and

conveying the mixed stream to the reactor.

20. The process of claim 19, wherein the second absorbent consists essentially of methanol.

21. The process of claim 19, further comprising the step of chilling the first absorbent and/or the second absorbent prior to the contacting.

22. The process of claim 19, wherein termination of supply of first absorbent to the absorber tower and providing of the second absorbent to the absorber tower occur substantially simultaneously.