

ABSTRACT

**IRIDIUM-CATALYSED CARBONYLATION PROCESS FOR THE
PRODUCTION OF ACETIC ACID**

A process for the production of an acetic acid process stream comprising less than 400 ppm propionic acid and less than 1500 ppm water comprises the steps:-

- (a) feeding methanol and/or a reactive derivative thereof and carbon monoxide to a carbonylation reactor in which there is maintained during the course of the process a liquid reaction composition comprising:-
 - (i) an iridium carbonylation catalyst;
 - (ii) methyl iodide co-catalyst;
 - (iii) optionally one or more promoters selected from the group consisting of ruthenium, osmium, rhenium, cadmium, mercury, zinc, gallium, indium and tungsten;
 - (iv) a finite amount of water at a concentration of less than about 8% by weight;
 - (v) methyl acetate;
 - (vi) acetic acid; and
 - (vii) propionic acid by-product and its precursors;
- (b) withdrawing liquid reaction composition from the carbonylation reactor and introducing at least part of the withdrawn liquid reaction composition, with or without the addition of heat, to a flash zone to form a vapour fraction comprising water, acetic acid product, propionic acid by-product, methyl acetate, methyl iodide and propionic acid precursors, and a liquid fraction comprising involatile iridium catalyst, involatile optional promoter or promoters, acetic acid and water;
- (c) recycling the liquid fraction from the flash zone to the carbonylation reactor;



- (d) introducing the vapour fraction from the flash zone into a first distillation zone;
- (e) removing from the first distillation zone at a point above the introduction point of the flash zone vapour fraction a light ends recycle stream comprising water, methyl acetate, methyl iodide, acetic acid and propionic acid precursors which stream is recycled in whole or in part to the carbonylation reactor, and
- (f) removing from the first distillation zone at a point below the introduction point of the flash zone vapour fraction, a process stream comprising acetic acid product, propionic acid by-product, and less than 1500 ppm water and,
- (g) if the process stream removed in step (f) comprises greater than 400 ppm propionic acid introducing said stream into a second distillation column, removing from a point below the introduction point of the stream from (f) propionic acid by-product and from a point above the introduction point of the stream from (f) an acetic acid process stream containing less than 400 ppm propionic acid and less than 1500 ppm water.

FIGURE 1

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