

ABSTRACT
PROCESS FOR THE CARBONYLATION OF AN ALCOHOL AND/OR A
REACTIVE DERIVATIVE THEREOF

A carbonylation process which comprises (a) contacting, in a first carbonylation reactor (1) at elevated temperature and pressure, an alcohol having n carbon atoms and/or a reactive derivative thereof with carbon monoxide in a liquid reaction composition comprising a halogen and/or halogen compound promoter and a Group VIII noble metal carbonylation catalyst to produce a carbonylation product comprising a carboxylic acid having $n+1$ carbon atoms and/or an ester of the carboxylic acid having $n+1$ carbon atoms and the alcohol having n carbon atoms and/or an anhydride of the carboxylic acid having $n+1$ carbon atoms; (b) withdrawing (via off-gas vent line 6) from the first carbonylation reactor, an off-gas stream comprising carbon monoxide and optionally halogen and/or halogen compound promoter, and optionally carbonylation product; and (c) contacting in a second carbonylation reactor (2), the withdrawn off-gas stream with an alcohol having m carbon atoms and/or a reactive derivative thereof in the presence of a halogen and/or halogen compound promoter and a heterogeneous carbonylation catalyst comprising a supported Group VIII noble metal to produce a further carbonylation product comprising a carboxylic acid having $m + 1$ carbon atoms and/or an ester of the carboxylic acid having $m+1$ carbon atoms and the alcohol having m carbon atoms and/or an anhydride of the carboxylic acid having $m+1$ carbon atoms.

Fig. 1