

The invention describes carbonylation method that includes (a) introduction in the first reactor (1) for carbonylation at high temperatures and pressure of alcohol containing n atoms of carbon, and/or its reactive derivative into contact with carbon monoxide in liquid reaction mix containing halogen and/or halogen compound as a promoter and a noble metal of group VIII as a carbonylation catalyst, resulting in a carbonylation product including carboxylic acid containing $n+1$ of carbon atoms and/or carboxylic acid ether containing $n+1$ carbon atoms, and alcohol containing n carbon atoms, and/or carboxylic acid anhydride containing $n+1$ carbon atoms; (b) removal (through the line (b) for waste gases removal) from the first reactor for carbonylation of waste gases flow including carbon monoxide, optionally halogen and/or halogen compound as a promoter and optionally a carbonylation product; and (c) introduction into the second reactor (2) for carbonylation of removable flow of waste gases into contact with alcohol containing m carbon atoms and/or its reactive derivative in the presence of halogen and/or halogen compound as a promoter and catalyst of heterogeneous carbonylation representing a noble metal of VIII group on a carrier with producing of additional amount of carbonylation product including carboxylic acid containing $m+1$ of carbon atoms, and/or carboxylic acid ether containing $m+1$ carbon atoms, and alcohol containing m carbon atoms, and/or carboxylic acid anhydride containing $m+1$ carbon atoms.