Claims

1. A method for improving reaction yield, comprising:

- feeding a raw material feedstock into a fixed bed reactor; contacting the raw material feedstock and a catalyst bed in the fixed bed reactor to produce a reaction product stream;
- passing the reaction product stream successively through a catalyst cushion, a space formed by the catalyst cushion and a reactor head, and an outlet of the fixed bed reactor;
- injecting an inert substance into the catalyst cushion,

wherein the reaction product stream comprises heat sensitive compounds selected from vinyl acetate, acrylic acid, methacrylic acid, acrylate, methacrylate, methyl methacrylate, ethylenically unsaturated aldehyde, acrolein, methacrolein, propylene, isobutylene, butadiene, and styrene compounds, ethylene oxide, and propylene oxide, and wherein the catalyst cushion is a layer of packing material selected from ceramic, glass, and quartz.

2. The method according to claim 1, wherein the inert substance is at least one of a gas or a liquid that can be vaporized after being heated.

3. The method according to claim 1 or 2, wherein the inert substance is selected from nitrogen, helium, argon, carbon dioxide, water, oxygenated organics with a carbon number less than or equal to 10, nitrogenous organics with a carbon number less than or equal to 10, naphthene with a carbon number less than or equal to 12, alkanes with a carbon number less than or equal to 12, aromatics with a carbon number less than or equal to 10, or a mixture thereof.

4. The method according to any of the preceding claims, wherein the inert substance is selected from nitrogen, helium, argon, carbon dioxide, water, C_6-C_8 alkane, C_6-C_8 aromatic, C_1-C_4 alcohol, C_1-C_4 acid, C_2-C_4 nitrile, C_2-C_4 ester, hexane, heptane, benzene, toluene, xylene, methanol, ethanol, propionic acid, methyl propionate, and acetonitrile.

5. The method according to any of the preceding claims, wherein the inert substance is injected into the catalyst cushion through a nozzle.

6. The method according to any of the preceding claims, wherein a weight of the inert substance injected is 0.1-5 times a weight of the feedstock.

7. The method according to claim 1, wherein the raw material feedstock comprises at least one of olefins, alkanes, aromatic hydrocarbons, carboxylic acids, carboxylic acid esters, aldehydes, alcohols, ethylene, propylene, isobutylene, propane, butane, isobutane, acetic acid, propionic acid, methyl acetate, methyl propionate, formaldehyde, vinylaldehyde, acrolein, methacrolein, methanol, butene-1, phenylethanol, and ethylbenzene.

8. The method according to claim 6, wherein the weight of the inert substance injected is 0.5-2 times the weight of the raw material feedstock.