Claims

1. A process for preparing a chemical product or a chemical composition in a production plant, comprising the steps of:

(I) reacting at least one substrate in a plant section comprising a reactor to form a reaction mixture comprising at least one chemical product or a chemical composition, the at least one substrate being introduced into the reactor with a mass flow m_1;

(II) working up the reaction mixture obtained in step (I) in a plant section comprising a workup apparatus to obtain a crude product and at least one secondary stream comprising the constituents separated from the crude product; and

(III) purifying the crude product obtained in step (II) in a plant section comprising at least one purifying apparatus to obtain a purified end product and at least one secondary stream comprising the constituents separated from the purified end product;

the process further comprising the shutdown of one or more plant sections from steps (I) to (III) with the proviso that the production plant is not shut down entirely,

wherein

on said shutdown of the one or more plant sections from steps (I) to (III) the mass flow m_1 in step (I) is reduced to zero and, in at least one of the plant sections that has not been shut down, the output stream of the plant section is used again as input stream for the respective plant section or an upstream plant section.

2. The process as claimed in claim 1, comprising steps (IV) and (V):

(IV) working up the at least one secondary stream obtained in step (II) in a workup unit;

(V) working up the at least one secondary stream obtained in step (III) in a workup unit,

wherein

on said shutdown of the one or more plant sections from steps (I) to (V) the mass flow m_1 in step (I) is reduced to zero and, in every plant section that has not been shut down, the output stream of the plant section is used again as input stream for the respective plant section or an upstream plant section.

3. The process as claimed in at least one of the preceding claims, wherein at least two substrates are reacted in the reactor from step (I) and the second substrate is introduced into the reactor from step (I) with a mass flow m_2.

4. The process as claimed in at least one of the preceding claims, further comprising a step (Ia), wherein at least one third substrate is reacted with the product of the reaction from step (I) in the reactor from step (I) or in a further reactor, and the at least one third substrate is introduced into the at least one reactor from step (Ia) with a mass flow m_3.

5. The process as claimed in at least one of the preceding claims, wherein the chemical product is a polycarbonate or one of its precursors, an isocyanate or one of its precursors, an active pharmaceutical ingredient, an olefin, aromatic or polyolefin.

6. A production plant for preparing a chemical product or a chemical composition, comprising the plant sections of:

   (I) a reactor for execution of the conversion of at least one substrate, preferably of a plurality of (especially two) substrates, to obtain a product mixture,

   (II) a workup apparatus for obtaining a crude product from the product mixture obtained in the reactor (I) alongside at least one secondary stream comprising the constituents separated from the crude product, and

   (III) a purifying apparatus for purifying the crude product obtained in the workup apparatus (II) to give a purified end product with removal of at least one secondary stream comprising the constituents separated from the purified end product,

   wherein the production plant is configured such that, on shutdown of one or more plant sections (I) to (III), but not the entire production plant, no further introduction of the at least one substrate into the reactor (I) takes place and, independently of one another or simultaneously, in every plant section unaffected by the shutdown, the output stream can be recycled and used as input stream for the respective plant section or an upstream plant section.

7. The plant as claimed in claim 6, wherein the plant is configured such that, independently of one another, the output stream in every other plant section unaffected by the shutdown can be recycled and used again as input stream for the respective plant section or an upstream plant section.

8. The plant as claimed in claim 6, wherein the plant is configured such that, simultaneously, the output stream in every other plant section unaffected by the shutdown can be recycled and used again as input stream for the respective plant section or an upstream plant section.

9. The plant as claimed in one of claims 6 to 8, comprising the workup units (IV) and (V):

(IV) a workup unit for workup of the at least one secondary stream obtained in the workup apparatus (II),

(V) a workup unit for workup of the at least one secondary stream obtained in the purifying apparatus (III),

wherein the production plant is configured such that, on shutdown of one or more plant sections (I) to (V), but not the entire production plant, no further introduction of the at least one substrate into the reactor (I) takes place and, independently of one another or simultaneously, in at least one plant section unaffected by the shutdown, the output stream can be recycled and used as input stream for the respective plant section or an upstream plant section.

10. A method of operating a production plant for preparing a chemical product or a product composition during a shutdown of the preparation process, the plant comprising the plant sections of:

(I) a reactor for execution of the conversion of at least one substrate, preferably of a plurality of (especially two) substrates, to obtain a product mixture,

(II) a workup apparatus for obtaining a crude product from the product mixture obtained in the reactor (I) alongside at least one secondary stream comprising the constituents separated from the crude product, and

(III) a purifying apparatus for purifying the crude product obtained in the workup apparatus (II) to give a purified end product with removal of at least one secondary stream comprising the constituents separated from the purified end product,

the method comprising the steps of:

(i) stopping the supply of the at least one substrate, preferably all substrates, into the reactor (I),

(ii) running at least one plant section in such a way that the output stream of the respective plant section is used as input stream for this plant section or an upstream plant section;

(iii) shutting down at least one plant section different from the at least one plant section of step (ii),

(iv) optionally opening the at least one plant section shut down in step (iii);

(v) performing a maintenance, cleaning, inspection and/or repair measure in the plant section shut down in step (iii);

(vi) closing and optionally inertizing the at least one plant section from step (v);

(vii) starting up the at least one plant section from step (vi);

(viii) starting the supply of the at least one substrate to the reactor (I).

11. The method as claimed in claim 12, wherein the plant additionally comprises the plant sections (IV) and (V):

(IV) a workup unit for workup of the at least one secondary stream obtained in the workup apparatus (II),

(V) a workup unit for workup of the at least one secondary stream obtained in the purifying apparatus (III).