

We claim:

1. A process for the continuous production of a reaction product of a diazo compound and a substrate in a multi-stage continuous flow reactor comprising at least two connected reactors in fluid communication with each other, wherein a reaction product formed at each stage of the multistage sequence is continuously discharged from an upstream reactor in which it is formed, and is fed as a continuous fluid stream into a downstream reactor whereupon it can undergo further conversion, the process being characterized in that a precursor compound of the diazo compound that is continuously formed in an upstream reactor is continuously discharged into a downstream reactor under conditions conducive to convert it into the diazo-compound, and wherein said downstream reactor contains the substrate with which the diazo-compound reacts to form the reaction product of the diazo compound and the substrate.
2. A process according to claim 1 wherein the diazo-compound is selected from the group consisting of diazoalkanes and diazocarboxylates, more particularly diazomethane, diazoethane and diazoacetate
3. A process according to claim 1 or claim 2, wherein the substrate is selected from the group consisting of olefins, aldehydes, ketones, cyclic ketones, carboxylic acids and acid chlorides.
4. A process according to claim 3 wherein the substrate is an olefin selected from di- or polyolefins, and more particularly those having at least one terminal (mono-substituted) double bond.
5. A process according to claim 3 or 4, wherein the olefin is selected from the group consisting of isoprene, myrcene, farnesene and β -springene.
6. A process according to any of the preceding claims, wherein the diazo compound precursor is an N-alkyl-N-nitroso compound selected from the group consisting of N-methyl-N-nitroso urea (MNU), N-Methyl-N-nitroso-p-toluenesulfonamide (Diazald), methyl N-methyl-N-nitroso carbamate, ethyl N-methyl-N-nitroso carbamate, and N-methyl-N-(2-methyl-4-oxopentan-2-yl)nitroso amide (Liquizald).

7. A process according to any of the preceding claims wherein the diazo compound is diazomethane, the substrate is an olefin and their reaction product is a cyclopropanated compound.

5 8. A process according to claim 7, wherein the diazomethane precursor compound formed in the upstream reactor is mixed with the olefin substrate, a catalyst and an organic solvent to form an organic phase, and this organic phase is mixed with an aqueous phase containing base to form a biphasic reaction mixture, which reaction mixture reacts to form the cyclopropanated compound in the downstream reactor.

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9. A process according to claim 8, wherein the diazomethane precursor compound formed in the upstream reactor is contained in the organic phase of a biphasic mixture, and wherein the organic phase containing the diazomethane precursor compound is separated from the aqueous phase of the biphasic mixture before being mixed with an olefin substrate, catalyst and organic solvent.

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10. A process according to any of the claims 7 to 9, comprising the steps of:

- Providing a multi-stage continuous flow reactor comprising at least two, more particularly at least three, and more particularly at least four or more connected reactors in fluid communication with each other;
- At each stage of the reaction, continuously feeding a fluid stream of reactants in a directed flow into a reactor under conditions conducive to form a reaction product;
- Continuously discharging from that reactor a fluid stream of reaction product, and feeding it into a successive reactor there to undergo further conversion to form a successive reaction product; characterized in that the diazomethane precursor compound formed as a reaction product in a reactor is continuously fed into a successive reactor under conditions conducive to convert the precursor compound into diazomethane, and wherein said successive reactor contains the olefin substrate with which the diazomethane reacts to form the cyclopropanated compound.

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11. A process according to claim 10, wherein the diazomethane precursor compound, discharged from the reactor is mixed continuously with the catalyst, substrate and solvent to form an organic phase, and this organic phase is mixed and reacted continuously with an aqueous phase containing a base, e.g. KOH in the successive reactor thereby to form the cyclopropanated compound.

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12. A process according to any of the preceding claims carried out under flow conditions.

13. A process according to claim 12, wherein the reaction is carried out in a microreactor.