

**TITLE: Process for the continuous synthesis of a modified
diene elastomer**

ABSTRACT

The invention relates to a process for the continuous synthesis of a modified diene elastomer comprising at least one silicon atom directly connected to the elastomer chain, comprising:

a) a stage of polymerization by means of n reactors r_1 to r_n which are equipped with an internal stirring system, which are assumed perfectly stirred and which are arranged in series, n varying from 2 to 15, the reactor r_1 being fed by an input solution comprising a solvent, one or more monomers, an anionic polymerization initiator and a polar agent, one or more of the reactors r_2 to r_n additionally being fed by reinjection of a purified solution comprising solvent and/or monomer(s), the purity of the or of each reinjected solution being such that the proportion of the number of dead chains in the output stream from the reactor r_n is less than 30% of the number of living chains initiated in the reactor r_1 , the temperature of each reactor varying from 20°C to 150°C and being greater than or equal to the temperature of the reactor which immediately precedes it, the temperature of the reactor r_n being greater than the temperature of the reactor r_1 ,

b) a stage of modification of the living diene elastomer obtained in the preceding stage and exhibiting a polydispersity index varying from 1.1 to 2, by means of at least one functionalization, coupling or star-branching agent, which makes it possible to introduce, into the elastomer, a functional group comprising at least one silicon atom directly connected to the elastomer chain.