8. The process according to one of the claims 1 to 7, wherein the common aliphatic medium has a content of branched, non-cyclic aliphatic hydrocarbons having a boiling point in the range of 45°C to 80°C at a pressure of 1013 hPa of at least 30 wt.-%.

9. The process according to one of the claims 1 to 8, wherein the reaction is performed in a polymerization reactor, and wherein the viscosity of the solution at the discharge of the polymerization reactor is less than 2000 cP.

10. The process according to one of the claims 1 to 9, wherein the solids content of the rubber solution obtained following in step b) is in the range of from 3 to 25 % by weight.

11. The process according to one of the claims 1 to 10, wherein molecular bromine or chlorine is used as halogenating agent.

12. The process according to one of the claims 1 to 11, wherein the amount of halogenating agent used is in the range of from 0.1 to 20 % by weight of the rubber.

13. The process according to one of the claims 1 to 12, wherein the halogenating agent is a brominating agent and is used in combination with an oxidizing agent.

14. The process according to one of the claims 1 to 13, wherein the process further comprises the curing of the halogenated rubber obtained in step d).

~~15. Use of a halogenated rubber prepared according to one of the claims 1 to 13 to prepare cured halogenated rubbers.~~

~~16. Use of a halogenated rubber prepared according to one of the claims 1 to 13 or a cured halogenated rubber prepared according to claim 15 as a part of a tyre.~~