A is a divalent organic radical which, as well as C and H, may contain heteroatoms such as O, N, S and/or Si.

9. Process for preparing diene polymers according to Claim 7, characterized in that alkali metal amides are obtained by reaction of secondary organic amines with organo-alkali metal compounds in situ or in a separate preforming step and one or more 1-oxa-2-silacycloalkanes are used for reaction with the reactive ends of the polymer chains.

10. Process according to Claim 7, characterized in that the 1-oxa-2-silacycloalkanes are added after completion of the polymerization.

11. Process according to Claim 9, characterized in that the alkali metal amides are used as anionic polymerization initiators.

12. Process according to Claim 9, characterized in that the secondary organic amines used are pyrrolidine or hexamethyleneimine, and the organo-alkali metal compound butyllithium.

13. Process according to Claim 9, characterized in that the molar amount of secondary amines is less than or equal to the molar amount of organo-alkali metal compounds, the molar ratio more preferably being 0.05 – 2.00:0.05 – 2.00.

14. Process according to Claim 7, characterized in that the amount of 1-oxa-2-silacycloalkanes is between 0.005 – 2% by weight, preferably between 0.01 – 1% by weight, based on the amount of polymer having reactive ends of the polymer chains.

15. Process according to Claim 7, characterized in that coupling reagents are used for the reaction.

16. Use of diene polymers according to any of Claims 1 - 6 for production of vulcanizable rubber compositions.

~~17. Vulcanizable rubber compositions obtainable according to Claim 16, characterized in that they comprise ageing stabilizers, oils, fillers, rubbers and/or rubber auxiliaries.~~

~~18~~17. Vulcanizable rubber compositions comprising diene polymers according to Claim 1 or 2.

~~19~~18. Vulcanizable rubber compositions comprising functionalized diene polymers having tertiary amino groups of the formula (I) or (II) at the start of the polymer chains and functional groups of the formula (III) at the end of the polymer chains according to Claim 1.

~~20~~19. Vulcanizable rubber compositions comprising functionalized diene polymers having tertiary amino groups of the formula (I) or (II) at the start of the polymer chains according to Claim 1 and functional groups of the formula (IV) at the end of the polymer chains according to Claim 2.

~~21~~20. Vulcanizable rubber compositions comprising functionalized diene polymers having tertiary amino groups of the formula (I) or (II) at the start of the polymer chains according to Claim 1 and functional groups of the formula (III) and (IV) at the end of the polymer chains according to Claims 1 and 2.

~~22~~21. Use of the vulcanizable rubber compositions according to any of Claims ~~19~~ 18 to ~~21~~ 20 for production of tyres, especially tyre treads.

~~23~~22. Use of the vulcanizable rubber compositions according to any of Claims ~~19~~ 18 to ~~21~~ 20 for production of mouldings, especially cable sheaths, hoses, drive belts, conveyor belts, roll covers, shoe soles, sealing rings and damping elements.

~~24. Tyres obtainable according to Claim 22.~~

~~25. Mouldings obtainable according to Claim 23.~~