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SYNTHETIC RUBBER

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This invention relates to a process for the manufacture of valuable rubber like masses.

In accordance with the present invention, butadiene, or its homologues, or their mixtures are polymerised with aliphatic or alicyclic hydrocarbons of the general formula:

C_nH_{2n-x}

wherein x is at least equal to 4, and in which at least one pair of conjugated ethylenic double bonds is present.

Hydrocarbons corresponding to the above general formula are, for example: myrcene, α-phellandrene, β-phellandrene, α-terpinene, 1-methyl-4 isopropenyltetrahydrobenzene, 1-methyl - 4 - isopropenyl 1-3 di-hydrobenzene etc.

Such hydrocarbons may be polymerized with butadiene or its homologues thus yielding mixed polymers or better mechanical properties than pure butadiene polymerizates.

The polymerization of a mixture of the above hydrocarbons with butadiene may be carried out according to any of the following methods:

1. Polymerization by the action of the usual catalysts and in the absence of solvents.

2. Polymerization in the solution state, using as solvents ketones, alcohols, or hydrocarbons which latter are stable to polymerization such as benzene or gasoline.

3. Polymerization in the emulsified state.

From a technological standpoint this latter is the simplest and best method. The hydrocarbons in question may be added to butadiene and or its homologues in any desired proportion, but the best results were obtained within a range between 20 and 150% by weight of butadiene or its homologues.

The following examples will further illustrate the nature of this invention.

Example I

	Parts
Butadiene	100
Myrcene	60
Oleic acid	12
A 2% ammonia solution	170
A 3% hydrogen peroxyde solution	30

The mixture of the above substances which forms a dispersion or artificial latex, is polymerised at 50–60° C for 4 days, while subjected to continuous stirring.

The mixture is then cooled and the rubber coagulated by means of acetic acid.

Example 2

	Parts
Butadiene	70
Isoprene	30
Methyl 1-isopropenyl 4-tetrahydrobenzene 1-3	35
A 7% solution of diethyl amino ethyloleil amide hydrocloride	150
Acetic acid	2
Thichloroacetic acid	3

The mixture of the above substances which constitutes a dispersion or artificial latex is polymerised at 50° C for 2–3 days while continuously stirred. The product obtained, which is similar to latex is treated for example with acetone or with a saturated solution of sodium cloride, and the coagulated rubber-like mass is separated, washed and dried.

The above examples have been reported to illustrate how the said invention may be carried out in practice, but the invention is not restricted to these examples. For instance other hydrocarbons corresponding to the general formula C_nH_{2n-x} as well as other emulsifying substances or other catalysts than those disclosed above may be employed.

Similarly the range of times and temperatures of the polymerization process may be varied, within very wide limites.

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