DESCRIPTION

TITLE OF INVENTION: COPOLYMER RUBBER, RUBBER COMPOSITION, AND CROSSLINKED RUBBER

TECHNICAL FIELD

[0001] The present invention relates to a copolymer rubber, a rubber composition, and a cross-linked rubber.

BACKGROUND ART

[0002] As a method of cross-linking a copolymer rubber, typically an acrylic rubber, usually a method of heating at about 150°C to 190°C for several to dozen minutes as primary cross-linking, and then heating under a heated air environment at 140°C to 200°C as secondary cross-linking (Patent Document 1) is used.

RELATED ART DOCUMENTS

PATENT DOCUMENTS

[0003] Patent Document 1: JP 2009-084514 A

SUMMARY

PROBLEM TO BE SOLVED

[0004] From the viewpoint of productivity of a cross-linked rubber, energy saving, and carbon neutrality, a rubber composition which can give a cross-linked rubber having good physical properties by only primary cross-linking without need for secondary cross-linking is desired.

[0005] The present disclosure has been made in consideration of such circumstances. An object of the present disclosure is to provide a copolymer rubber which has good scorch stability and can give a cross-linked rubber having sufficient mechanical properties without secondary cross-linking.

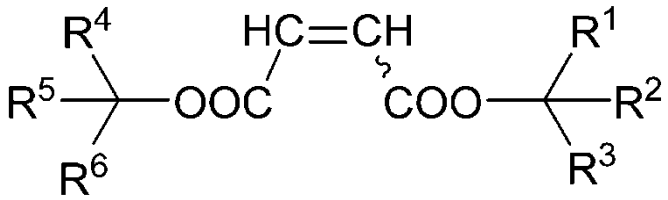
MEANS FOR SOLVING PROBLEMS

[0006] The present disclosure, who has conducted extensive research, has found that the above object can be achieved by a copolymer rubber obtained by copolymerizing a predetermined butenedioic acid diester structure-containing monomer and a radical polymerizable monomer, and has completed the present disclosure.

[0007] Specifically, the present disclosure provides a copolymer rubber, a rubber composition, and a cross-linked rubber described below.

[1] In an aspect, there is provided a copolymer rubber obtained by copolymerizing a butenedioic acid diester structure-containing monomer represented by General Formula (1) below and a radical polymerizable monomer:

[Chem. 1]



(1)

(in General Formula (1), R^1 is a C_1 to C_4 alkyl group; R^2 is a group represented by R^7 or OR^8; R^7 is an optionally substituted C_1 to C_8 alkyl group; R^8 is an optionally substituted C_1 to C_8 alkyl group or an optionally substituted polyalkylene glycol group; R^3, R^4, and R^6 each independently represent a hydrogen atom or a C_1 to C_4 alkyl group; R^5 is a hydrogen atom or a group represented by R^7 or OR^8; when R^3 is a hydrogen atom, R^2 is a group represented by OR^8; R^1 and R^2 may be bonded to each other to form a ring; and R^4 and R^5 may be bonded to each other to form a ring).

[2] The copolymer rubber according to [1], wherein the content of a unit of the butenedioic acid diester structure-containing monomer represented by General Formula (1) is 0.1 to 10% by weight.

[3] The copolymer rubber according to [1] or [2], wherein as the radical polymerizable monomer, the copolymer rubber contains at least one selected

[8] In another aspect, there is provided a rubber composition comprising the copolymer rubber according to any one of [1] to [7] and a cross-linking agent.
[9] The rubber composition according to [8], further comprising a cross-linking accelerator.
[10] The rubber composition according to [8] or [9], further comprising a filler.
[11] In another aspect, there is provided a cross-linked rubber obtained by cross-linking the rubber composition according to any one of [8] to [10]
[12] The cross-linked rubber according to [11], wherein the cross-linked rubber is a hose material, a sealing material, a tubing material, a belt material, or a boot material.

EFFECTS OF THE DISCLOSURE

[0008] The present disclosure can provide a copolymer rubber which has good scorch stability and can give a cross-linked rubber having sufficient mechanical properties without secondary cross-linking.

DESCRIPTION OF EMBODIMENTS

[0009] The copolymer rubber according to the present invention is obtained by copolymerizing a butenedioic acid diester structure-containing monomer represented by General Formula (1) and a radical polymerizable monomer (which are described later).
[0010] Since the copolymer rubber according to the present invention contains a unit of the butenedioic acid diester structure-containing monomer represented by General Formula (1), such a copolymer rubber has good scorch stability and can give a cross-linked rubber having sufficient mechanical properties (specifically, sufficient tensile properties, appropriate hardness, and sufficient compression set resistance, and sufficiently suppressed change in tensile properties caused by aging) without secondary cross-linking.