CLAIMS

1. A rubber composition, comprising uncrosslinked rubber and rubber particles having a radiation crosslinked structure, wherein the rubber particles having a radiation crosslinked structure are synthetic rubber particles and/or natural rubber particles with a gel content of at least 60wt% and wherein the uncrosslinked rubber is styrene-butadiene rubber, and further wherein the weight ratio of the rubber particles having radiation crosslinked structure to the uncrosslinked rubber is 1:99-20:80, and wherein the rubber composition comprises a continuous phase comprising the uncrosslinked styrene-butadiene rubber, and a dispersed phase comprising the rubber particles having radiation crosslinked structure, which are dispersed in the continuous phase with an average particle sizes ranging from 20 nm to 500nm, characterized in that the composition is obtained by mixing the components comprising uncrosslinked rubber latex and latex of rubber particles having radiation crosslinked structure and then coagulating them, wherein the latex of rubber particles having radiation crosslinked structure is the rubber latex obtained by irradiation crosslinking.

2. The composition according to claim 1, characterized in that the rubber particles having radiation crosslinked structure are one or more selected from the group consisting of natural rubber particles, styrene-butadiene rubber particles, carboxylated styrene-butadiene rubber particles, nitrile butadiene rubber particles, carboxylated nitrile butadiene rubber particles, chloroprene rubber particles, polybutadiene rubber particles, silicone rubber particles, acrylic rubber particles, styrene-butadiene-vinylpyridine rubber particles; preferably one or more selected from the group consisting of nitrile butadiene rubber particles, styrene-butadiene-vinylpyridine rubber particles, styrene-butadiene rubber particles, carboxylated styrene-butadiene rubber particles; more preferably one or more selected from the group consisting of styrene-butadiene rubber particles, carboxylated styrene-butadiene rubber particles, nitrile butadiene rubber particles; most preferably nitrile butadiene rubber particles.

3. The composition according to claim 1 or claim 2, characterized in that the rubber particles having radiation crosslinked structure are of homogeneous structure.

4. The composition according to any one of claims 1 to 3, characterized in that the gel content of the rubber particles having radiation crosslinked structure is at least 75wt% and preferably 80wt% or higher.

5. The composition according to any one of claims 1 to 4, characterized in that the average particle size of the rubber particles having radiation crosslinked structure is 50-300 nm, preferably 50-200 nm.

6. The composition according to any one of claims 1 to 5, characterized in that the weight ratio of the rubber particles having radiation crosslinked structure to the uncrosslinked rubber is 1:99-10:90.

7. The composition according to any one of claims 1 to 6, characterized in that the weight ratio of the rubber particles having radiation crosslinked structure to the uncrosslinked rubber is 2:98-8:92.

8. The composition according to any one of claims 1 to 7, characterized in that the composition is consisting of the uncrosslinked rubber and rubber particles having a radiation crosslinked structure.

9. A method for preparing a rubber composition according to any one of claims 1-8, comprising the following steps:

(1) subjecting a synthetic rubber latex and/or natural rubber latex to radiation cross-linking to provide synthetic rubber particles and/or natural rubber particles in the latex with a crosslinked structure, the said gel content of 60% by weight or higher and meanwhile an average particle size fixed in the range of 20 to 500nm;

(2) mixing the above radiation crosslinked synthetic rubber latex and/or the natural rubber latex with a latex of the uncrosslinked styrene-butadiene rubber until homogeneous according to a specified weight ratio of the rubber particles having crosslinked structure to the uncrosslinked styrene-butadiene rubber; and

(3) coagulating the above mixed latices to obtain the rubber composition.

10. The method according to claim 9, characterized in that the synthetic rubber latex and/or natural rubber latex is/are one or more selected from the group consisting of natural rubber latex, styrene-butadiene rubber latex, carboxylated styrene-butadiene rubber latex, nitrile butadiene rubber latex, carboxylated nitrile butadiene rubber latex, chloroprene rubber latex, polybutadiene rubber latex, silicone rubber latex or acrylic rubber latex, styrene-butadiene-vinylpyridine rubber latex; preferably one or more selected from the group consisting of nitrile butadiene rubber latex, styrene-butadiene-vinylpyridine rubber latex, styrene-butadiene rubber latex, carboxylated styrene-butadiene rubber latex; more preferably one or more

selected from the group consisting of styrene-butadiene rubber latex, carboxylated styrene-butadiene rubber latex, nitrile butadiene rubber latex; most preferably nitrile butadiene rubber latex.

11. The rubber composition according to any one of claims 1-8, wherein the composition is a vulcanized composition comprising vulcanized styrene-butadiene rubber matrix and nitrile butadiene rubber particles having a radiation crosslinked structure which is dispersed with an average particle size fixed in the range of 20 to 500nm in the vulcanized styrene-butadiene rubber matrix.