CLAIMS

1. A photocatalyst-carrying structure provided with a carrier and a photocatalyst layer carried on the carrier with an adhesive layer there between; wherein, the adhesive layer contains an aqueous silicone-modified resin, and

the aqueous silicone-modified resin is a resin obtained by emulsion polymerization of a monomer in the presence of an emulsifier in an aqueous medium, and is further modified with silicone using a compound having a silicone structure.

2. The photocatalyst-carrying structure according to claim 1, wherein the aqueous silicone-modified resin is an aqueous silicone-modified (meth)acrylic resin.

3. The photocatalyst-carrying structure according to claim 2, wherein the monomer consists of a (meth)acrylate monomer selected from the group consisting of acrylic acid esters, methacrylic acid esters and mixtures thereof, and at least one type of comonomer selected from the group consisting of acrylamide monomers, methacrylamide monomers, vinyl monomers, ethylenic unsaturated monomers having a carboxylic acid group, vinyl cyanides, aromatic vinyl monomers, vinyl halides, butadiene and ethylene that is capable of copolymerizing with the aforementioned (meth)acrylate monomer.

4. The photocatalyst-carrying structure according to claim 2 or 3, wherein the amount of the (meth)acrylate monomer in the monomer is 90% by weight to 100% by weight, the amount of the comonomer is 0% by weight to 10% by weight based on the total weight of the (meth)acrylate monomer and the comonomer, and the (meth)acrylate monomer contains a cycloalkyl ester of acrylic acid or (meth)acrylic acid having 5 to 12 carbon atoms, or a mixture thereof, in an amount equal to 5% by weight or more based on the total weight of the

monomer.

5. The photocatalyst-carrying structure according to any of claims 2 to 4, wherein the emulsifier is at least one type selected from the group consisting of an ethylenic unsaturated monomer having a sulfonic acid group or sulfonate group, an ethylenic unsaturated monomer having a sulfuric acid ester group, and a mixture thereof.

6. The photocatalyst-carrying structure according to any of claims 2 to 5, wherein the compound having a silicone structure is at least one type selected from the group of compounds represented by the following formula (I):

[Chemical Formula 1]

$$(R_1)_nSi(OR_2)_{4-n} \qquad (I)$$

(wherein, R_1 represents a hydrogen atom, an aliphatic hydrocarbon group having 1 to 16 carbon atoms, an aryl group having 6 to 10 carbon atoms, a heteroaryl group having 4 to 5 carbon atoms, an aralkyl group having 7 to 11 carbon atoms, a cycloalkyl group having 5 to 6 carbon atoms, a vinyl group or a (meth)acroyloxyalkyl group having 1 to 10 carbon atoms, R_2 represents an alkyl group having 1 to 8 carbon atoms, an acyl group or a hydrogen atom, n represents 1 or 2, in the case n is 2, R_1 may be the same or different or R_1 may mutually bond to form a ring, and R_2 may be the same or different), or a cyclic polysiloxane.

7. The photocatalyst-carrying structure according to claim 6, wherein the compound having a silicone structure is a mixture of at least one type of selected from the group consisting of compounds in which n is 1 in formula (I) and at least one type selected from the group consisting of compounds in which n is 2.

8. The photocatalyst-carrying structure according to claim 7, wherein, in the compound having a silicone structure, the ratio between at least one type selected from the group consisting of compounds in which n is 1 in formula (I) and at least one type selected from the group consisting of compounds in which n is 2 is a molar ratio of 1/10 or more.

9. The photocatalyst-carrying structure according to any of claims 1 to 8, wherein the photocatalyst layer is composed of a photocatalyst particle complex containing 25% by weight to 95% by weight of a metal oxide gel or metal hydroxide gel.

10. The photocatalyst-carrying structure according to any of claims 1 to 9, wherein the adhesive layer further contains at least one type of compound selected from the group consisting of (poly)ethylene glycol, (poly)ethylene glycol monoalkyl ethers, (poly)ethylene glycol esters, (poly)ethylene glycol ether esters, (poly)propylene glycol, (poly)propylene glycol monoalkyl ethers, (poly)propylene glycol esters and (poly)propylene glycol ether esters.

CLAIMS

1. A photocatalyst-carrying structure provided with a carrier and a photocatalyst layer carried on the carrier with an adhesive layer there between; wherein, the adhesive layer contains an aqueous silicone-modified resin, and

the aqueous silicone-modified resin is a resin obtained by emulsion polymerization of one or more monomers in the presence of an emulsifier in an aqueous medium, and is further modified with silicone using a compound having a silicone structure,

the adhesive layer is formed by coating onto the carrier with a composition for forming the adhesive layer, followed by drying, wherein the composition for forming the adhesive layer contains the aqueous silicone-modified resin and 2% by weight to 15% by weight of at least one compound selected from the group consisting of (poly)ethylene glycol, (poly)ethylene glycol monoalkyl ethers, (poly)ethylene glycol esters, (poly)ethylene glycol ether esters, (poly)propylene glycol, (poly)propylene glycol monoalkyl ethers, (poly)propylene glycol esters and (poly)propylene glycol ether esters in the composition for forming the adhesive layer.

2. The photocatalyst-carrying structure according to claim 1, wherein the aqueous silicone-modified resin is an aqueous silicone-modified (meth)acrylic resin.

3. The photocatalyst-carrying structure according to claim 2, wherein the monomer consists of a (meth)acrylate monomer selected from the group consisting of acrylic acid esters, methacrylic acid esters and mixtures thereof, and at least one comonomer selected from the group consisting of acrylamide monomers, methacrylamide monomers, vinyl monomers, ethylenic unsaturated monomers having a carboxylic acid group, vinyl cyanides, aromatic vinyl monomers, vinyl halides, butadiene and ethylene that is capable of copolymerizing with the aforementioned (meth)acrylate monomer.

4. The photocatalyst-carrying structure according to claim 2 or 3, wherein the amount of the (meth)acrylate monomer in the monomer is 90% by weight to 100% by weight, the

amount of the comonomer is more than 0% by weight to 10% by weight based on the total weight of the (meth)acrylate monomer and the comonomer, and the (meth)acrylate monomer contains a cycloalkyl ester of acrylic acid or (meth)acrylic acid having 5 to 12 carbon atoms, or a mixture thereof, in an amount equal to 5% by weight or more based on the total weight of the monomer.

5. The photocatalyst-carrying structure according to claim 4, wherein the emulsifier is at least one selected from the group consisting of an ethylenic unsaturated monomer having a sulfonic acid group or sulfonate group, an ethylenic unsaturated monomer having a sulfuric acid ester group, and a mixture thereof.

6. The photocatalyst-carrying structure according to any of claims 2 to 5, wherein the compound having a silicone structure is at least one selected from the group of compounds represented by the following formula (I):

[Chemical Formula 1]

$$(R_1)_nSi(OR_2)_{4-n} \qquad (I)$$

(wherein, R_1 represents a hydrogen atom, an aliphatic hydrocarbon group having 1 to 16 carbon atoms, an aryl group having 6 to 10 carbon atoms, a heteroaryl group having 4 to 5 carbon atoms, an aralkyl group having 7 to 11 carbon atoms, a cycloalkyl group having 5 to 6 carbon atoms, a vinyl group or a (meth)acroyloxyalkyl group having 1 to 10 carbon atoms, R_2 represents an alkyl group having 1 to 8 carbon atoms, an acyl group or a hydrogen atom, n represents 1 or 2, in the case n is 2, R_1 may be the same or different or R_1 may mutually bond to form a ring, and R_2 may be the same or different), or a cyclic polysiloxane.

7. The photocatalyst-carrying structure according to claim 6, wherein the compound having a silicone structure is a mixture of at least one selected from the group consisting of compounds in which n is 1 in formula (I) and at least one selected from the group consisting of compounds in which n is 2.

8. The photocatalyst-carrying structure according to claim 7, wherein, in the compound having a silicone structure, the ratio between at least one selected from the group consisting of compounds in which n is 1 in formula (I) and at least one selected from the group consisting of compounds in which n is 2 is a molar ratio of 1/10 or more.

9. The photocatalyst-carrying structure according to any of claims 1 to 8, wherein the photocatalyst layer is composed of a photocatalyst particle complex containing 25% by weight to 95% by weight of a metal oxide gel or metal hydroxide gel.