Claims

[Claim 1]
A method for producing a nanodiamond doped with a Group 14 element, the method comprising:
detonating by exploding an explosive composition containing at least one explosive and at least one Group 14 element compound in a sealed container to obtain a nanodiamond doped with at least one Group 14 element selected from the group consisting of Si, Ge, Sn, and Pb;
subjecting the nanodiamonds doped with the Group 14 element to an alkali treatment to remove the Group 14 element and/or oxide thereof, and
further subjecting a post treatment including gas-phase oxidation.

[Claim 2]

The method for producing a nanodiamond doped with a Group 14 element according to claim 1, further including treating the nanodiamond doped with the Group 14 element with a mixed acid of concentrated nitric acid and concentrated sulfuric acid before or after the alkali treatment.

[Claim 3]
The method for producing a nanodiamond doped with a Group 14 element according to claim 1 or 2, wherein the explosive composition further comprises a compound comprising at least one third element selected from the group consisting of B, P, S, Cr, Al, Li, Na, K, Cs, Mg, Ca, Sr, Ba, Ti, Zr, V, Nb, Ta, Mo, W, Mn, Fe, Ni, Cu, Ag, Zn, Cd, Hg, Ga, In, Tl, As, Sb, Bi, Se, Te, Co, Xe, F, Y, and lanthanoids.

[Claim 4]
A method for purifying a nanodiamond doped with a Group 14 element, the method comprising:
subjecting a nanodiamond composition containing at least one Group 14 element selected from the group consisting of Si, Ge, Sn, and Pb and/or oxide thereof and a nanodiamond doped with the Group 14 element to an alkali treatment to remove the Group 14 element and/or oxide thereof, and
further subjecting a post treatment including gas-phase oxidation.

[Claim 5]
The method for purifying a nanodiamond doped with a Group 14 element according to claim 4, wherein the nanodiamond composition is obtained by mixed acid treatment.

[Claim 6]
The method for purifying a nanodiamond doped with a Group 14 element according to claim 4 or 5, wherein the nanodiamond composition further comprising at least one third element selected from the group consisting of B, P, S, Cr, Al, Li, Na, K, Cs, Mg, Ca, Sr, Ba, Ti, Zr, V, Nb, Ta,

Mo, W, Mn, Fe, Ni, Cu, Ag, Zn, Cd, Hg, Ga, In, Tl, As, Sb, Bi, Se, Te, Co, Xe, F, Y, and lanthanoids, and/or oxide thereof.

[Claim 7]

The method for purifying a nanodiamond doped with a Group 14 element according to any one of claims 4 to 6, wherein the nanodiamond is further doped with at least one third element selected from the group consisting of B, P, S, Cr, Al, Li, Na, K, Cs, Mg, Ca, Sr, Ba, Ti, Zr, V, Nb, Ta, Mo, W, Mn, Fe, Ni, Cu, Ag, Zn, Cd, Hg, Ga, In, Tl, As, Sb, Bi, Se, Te, Co, Xe, F, Y, and lanthanoids.