CLAIMS

1. A photosensitive composition comprising:

synthetic nanocrystalline hydroxyapatite or a synthetic precursor thereof doped with a rare earth ion, wherein the nanocrystalline hydroxyapatite or synthetic precursor thereof is fluoride ion-substituted and further doped with aluminum ions;

monetite; and

~~one or more synthetic minerals of formula $CaHPO_4.xH_2O$ (wherein x is 0, 1 or 2)~~brushite.

~~2. A photosensitive composition as claimed in claim 1 wherein the one or more $CaHPO_4.xH_2O$ minerals is monetite or brushite.~~

~~3. A photosensitive composition as claimed in claim 1 or 2 wherein the one or more $CaHPO_4.xH_2O$ minerals is monetite and brushite.~~

~~4. A photosensitive composition as claimed in any preceding claim wherein the nanocrystalline hydroxyapatite or synthetic precursor thereof is fluoride ion-substituted.~~

~~5. A photosensitive composition as claimed in any preceding claim wherein the nanocrystalline hydroxyapatite or synthetic precursor thereof is further doped with aluminium ions.~~

~~6~~2. A photosensitive composition as claimed in ~~any preceding~~ claim 1 wherein the rare earth ion exhibits absorption bands which substantially match or overlap one or more absorption bands of the synthetic nanocrystalline hydroxyapatite.

~~7~~3. A photosensitive composition as claimed in ~~any preceding~~ claim 1 or 2 wherein the rare earth ion is an erbium, ytterbium, holmium or thulium ion.

~~8~~4. A photosensitive composition as claimed in any preceding claim obtained or obtainable by a process comprising:

(a) preparing an aqueous mixture of a calcium ion-containing solution, a phosphate ion-containing solution and a rare earth ion-containing dopant solution at a pH in the range 5 to 14;

(b) causing the formation of nanocrystalline hydroxyapatite doped with a rare earth ion; and

(c) isolating the photosensitive composition.

~~9~~5. A photosensitive composition as claimed in claim ~~8~~ 4 wherein in step (a) a source of fluoride ions is added to the aqueous mixture.

~~10~~6. A photosensitive composition as claimed in claim ~~8~~ 4 or ~~9~~ 5 wherein in step (a) a source of aluminium ions is added to the aqueous mixture.

~~11~~7. An aqueous, ketonic or alcoholic dispersion of a photosensitive composition as claimed in any preceding claim.

~~12~~8. A process for preparing a photosensitive composition as defined in any of claims 1 to ~~10~~ 6 comprising:

(a) preparing an aqueous mixture of a calcium ion-containing solution, a phosphate ion-containing solution and a rare earth ion-containing solution at a pH in the range 5 to 14;

(b) causing the formation of synthetic nanocrystalline hydroxyapatite doped with a rare earth ion; and

(c) isolating the photosensitive composition.

~~13~~9. A cosmetic method for whitening or veneering a tooth of a human or non-human animal subject comprising:

(1) applying an amount of a photosensitive composition as defined in any of claims 1 to ~~10~~ 6 or a physiologically tolerable formulation thereof to a surface of the tooth other than a dentinal surface; and

(2) irradiating the amount of the photosensitive composition with laser irradiation so as to promote densification.

~~14~~10. A method for generating an image of an exposed dentinal surface of a tooth of a human or non-human animal subject comprising:

(A) administering an amount of a photosensitive composition as defined in any of claims 1 to ~~10~~ 6 or a physiologically tolerable formulation thereof to the exposed dentinal surface;

(B) irradiating the photosensitive composition or physiologically tolerable formulation thereof with irradiation;

(C) capturing the radiation emitted by the photosensitive composition or physiologically tolerable formulation thereof; and

(D) generating from the radiation emitted by the photosensitive composition or physiologically tolerable formulation thereof an image of the exposed dentinal surface.

~~15~~11. Photosensitive composition as defined in any of claims 1 to ~~10~~ 6 or a physiologically tolerable formulation thereof for use in restorative or cosmetic dentistry.