3. A method according to claim 1 or 2, wherein the organic ligands comprise a betadicarbonyl compound that exhibit keto-enol tautomerism, such as acetylacetonate, 2,4-heptanedione or 2-(acetoacetoxyethyl) methacrylate, preferably, the organic ligands are acetylacetonate ligands.

4. A microsphere obtainable by a method according to any one of claims 1-3.

5. A microsphere comprising a lanthanide metal phosphate complex wherein the lanthanide metal is present in an amount of more than 20 wt.%, based on total weight of the microsphere, and wherein the lanthanide metal complex comprises a lanthanide ion and phosphate.

6. A microsphere according to claim 4 or 5, having an organic ligand content of 20 wt.% or less, such as 10 wt.% or less, preferably 5 wt.% or less, such as 1 wt.% or less.

7. A microsphere according to any one of claims 4-6, wherein the microsphere has an atomic phosphor content of 3 wt.% or more, such as 5 wt.% or more, or even 10 wt.% or more, based on total weight of the microsphere.

8. A microsphere according to any one of claims 4-7, having a lanthanide metal content of more than 22 wt.%, based on total weight of the microsphere, preferably in the range of 22-70 wt.%

9. A microsphere according to claim 5, having an organic ligand content of 10 wt.% or less, an atomic phosphor content of 5 wt.% or more, based on total weight of the microsphere, and a lanthanide metal content of more than 22 wt.%, based on total weight of the microsphere.

910. A microsphere according to any one of claims 4-89, wherein

- the lanthanide metal is yttrium, and wherein the microsphere has an yttrium content in the range of 22-45 wt.%, more preferably in the range of 25-40 wt.%, based on total weight of the microsphere; or

- the lanthanide metal is not yttrium, and wherein the microsphere has a lanthanide content in the range of 30-70 wt.%, based on total weight of the microsphere, preferably in the range of 40-65 wt.%, such as in the range of 50-60 wt.%

~~10~~11. A microsphere according to any one of claims 4-~~9~~10, wherein the lanthanide metal comprises one or more from the group consisting of yttrium, holmium, gadolinium, dysprosium, lutetium, and samarium, preferably the lanthanide metal comprises one or more from the group consisting of holmium, gadolinium, dysprosium, lutetium, yttrium and samarium, more preferably the lanthanide metal is holmium.

~~11~~12. A microsphere according to any one of claims 4-~~10~~11, wherein the microsphere has a diameter in the range of from 20 nm to 300 μm, such as in the range of 20-200 nm, or in the range of from 1-10 μm, or in the range of from 10-200 μm.

13. A microsphere according to claim 12, wherein the microsphere has a diameter in the range of from 1-10 μm, or in the range of from 10-200 μm.

~~12~~14. A microsphere according to any one of claims 4-~~11~~13, wherein the microsphere has been made radioactive.

~~13~~15. A powder comprising a number of microspheres as defined in any one of claims 4-~~12~~14.

~~14~~16. A powder according to claim ~~13~~15, wherein said microspheres have an average sphericity, S, of more than 0.90, preferably more than 0.92, more preferably of more than 0.95, an even more preferably more than 0.97, wherein the sphericity, S, is defined by

$$S = \frac{4\pi A}{P^2}, \text{ wherein}$$

A is the projected area of the microsphere in a microscopic image; and

P is the perimeter of the microsphere in a microscopic image.

~~15~~17. A suspension comprising the microsphere according to any one of claims 4-~~12~~14 or a powder according to claim ~~13~~15 or ~~14~~16, said suspension preferably being a therapeutic suspension, an MRI scanning suspension, and/or a nuclear scanning suspension.

~~16~~18. Use of a microsphere according to any one of claims 4-~~12~~14, a powder according to claim ~~13~~15 or ~~14~~16, or a suspension according to claim ~~15~~17 in the manufacture of a medicament for detecting and/or treating a malignancy, wherein said malignancy preferably comprises a liver metastasis.

~~17~~19. A method for detecting a tumour, comprising

- obtaining a scanning image from an individual that had been administered the a scanning suspension according to claim ~~15~~17; and
- determining whether said image reveals the presence of a tumour.

~~18~~20. A therapeutic composition comprising a microsphere according to any one of claims 4-~~12~~14, a powder according to claim ~~13~~15 or ~~14~~16, or a suspension according to claim ~~15~~17, wherein the microsphere(s) is(are) radioactive.