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(54) **Title:** MAGNETITE-SILVER HETERODIMER NANOPARTICLES AND THEIR PREPARATION AND USE FOR TWO-PHOTON FLUORESCENCE

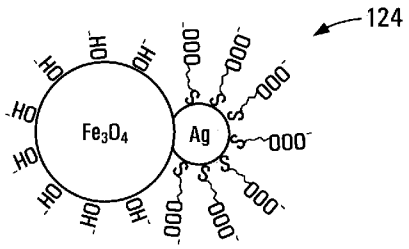

FIG. 4

(57) **Abstract:** A heterodimer particle is provided which comprises a first component particle comprising magnetite and a second component particle comprising silver. The second component particle may have a structure and a particle size selected to generate two-photon fluorescence emission. The heterodimer particle may be irradiated with light of a wavelength selected to induce two-photon fluorescence emission, which is then detected. Tetramethylammonium hydroxide may be bonded to the surface of the first component and glutathione may be bonded to the surface of the second component. The heterodimer particle may be formed by preparing a magnetite particle and growing a silver particle on the magnetite particle, in the presence of 1,2-dodecanediol as a reducing agent.

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