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(54) Title: MULTIPHASIC CRYSTALLINE NANOPARTICLES AND METHODS OF PRODUCING THEREOF

(57) Abstract: The present disclosure provides for a method of producing multiphasic crystalline nanoparticle(s), comprising: (a) preparing a mixture of at least two metal precursors and solvent; (b) applying the mixture to a substrate; and (c) subjecting the mixture to laser irradiation for a duration of about 0.1 ms to about 500 ms, at a power of about 0.1 W to about 20 W, wherein step (c) comprises laser irradiating a mixture which does not comprise pure metal. The present disclosure also provides for a multiphasic crystalline nanoparticle comprising at least four metals selected from the group consisting of Li, Be, Na, Mg, K, Ca, Rb, Sr, Ba, Fr, Ra, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Mo, Ru, Rh, Pd, Ag, Cd, W, Re, Os, Ir, Pt, Au, Hg, Nb, Ce, Al, Cs, Si, Ge, Sn, Pb and combinations thereof, and at least two phases/and or crystal structures selected from the group consisting of FCC, BCC, cubic rock salt, tetragonal, rutile tetragonal, hexagonal, orthorhombic, rhombohedral, monoclinic or triclinic crystal systems. The present disclosure further provides for a multiphasic crystalline nanoparticle disclosed herein, for use in inhibiting bacterial growth.



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