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(54) Title: NANOMETRIC-SIZED CERAMIC MATERIALS, PROCESS FOR THEIR SYNTHESIS AND USES THEREOF

(57) Abstract: The present invention concerns nanometric-sized ceramic materials in the form of multiple crystalline structures, composites, or solid solutions, the process for their synthesis, and uses thereof. These materials are mainly obtained by detonation of two water-in-oil (W/O) emulsions, one of which is prepared with precursors in order to present a detonation regime with temperature lower than 2000°C, and they present a high chemical and crystalline phase homogeneity, individually for each particle, as well as a set of complementary properties adjustable according to the final applications, such as a homogeneous distribution of the primary particles, very high chemical purity level, crystallite size below 50 nm, surface areas by mass unit between 25 and 500 m²/g, and true particle densities higher than 98% of the theoretical density. This set of characteristics makes this materials particularly suitable for a vast range of applications in the nanotechnology field, such as, for example, nanocoatings, magnetic nanofluids, nanocatalysts, nanosensors, nanopigments, nanoadditives, ultra light nanocomposites, drug release nanoparticles, nanomarkers, nanometric films, etc.



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