OAK RIDGE NATIONAL LABORATORY
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Improved Properties of Nanomaterials Using Complementary NanoFermentation Technique

Disclosure Number

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Technology Summary

One synthetic platform technologies for nanomaterials at ORNL, “NanoFermentation (NF)”, can be defined as “A biomineralization process using microbial activity (respiration or fermentation) as a driving force to focus on both quality and quantity of nanoparticle production along with various inoculation packages”, hereafter “conventional NF”. Conventional NF produced various magnetic materials doped with transition metals, lanthanides, and uranium. After the target materials became semiconducting materials and phosphor and electrical materials, the small particle (aggregates of crystallites) size, high dispersivity, and clean surface based on basically fine crystallite size were critically required. Therefore we are filing this invention disclosure in that gaseous H2S formation by metal-reducing bacteria with thermodynamic consideration, followed by metal sulfide precipitation in another reaction vessel which can include metal salt and capping molecules that can control the surface and size as well as any toxic chemical to bacteria.

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