Request for Proposal RFP_2020_0009: Innovative Technology for Synthesis of High Purity Monocrystalline Perovskite Oxide Nanoparticles

RFP Title

Innovative Technology for Synthesis of High Purity Monocrystalline Perovskite Oxide Nanoparticles

Due Date

Mar 19

Opportunity

Timeline

Financials

RFP Description

NineSigma, representing a major manufacturer, seeks a technology for synthesis of high purity monocrystalline perovskite oxide nanoparticles applicable to industrial-scale synthesis.

Background

Key Success Criteria

Target perovskite oxide nanoparticles

- Perovskite oxides: BaTiO₃, CaZrO₃
- Size: 10–100 nm
- Narrow particle diameter distribution is desirable
- Shape: Uniform spherical or cubic shape
- Crystalline nature
- BaTiO₃: Desirably close to the theoretical axial ratio (c/a)
- CaZrO₃: Not including a hetero-phase

Manufacturing process requirements

- Target production volume on an industrial scale: 1 t/month (established by 2025)
- Production volume on a lab scale: Several kg/1–2 months (established by 2022)
- Both build-up and breakdown processes are acceptable
- No agglomerated particle
- Uniform perovskite crystalline form is desirable
- Both continuous flow and batch processes are acceptable

Area of Interest

Chemistry-Inorganic
Chemistry > Catalysis
Chemistry > Other Chemistry
Chemistry > Synthetic Chemistry
Chemistry > Chemistry-General

Possible Approaches

Possible approaches

Anticipated approaches include followings, but not limited to following technologies; proposals of various technology applicable to industrial-scale synthesis are welcome:

- Solid-phase synthesis
- Hydrothermal synthesis
- Oxalate method
- Citric acid method
- Sol-gel process
- Alkoxide method
- Vapor deposition (e.g., PVD, CVD)

Creation Time: Feb 17 at 05:57 AM
Approaches not of Interest

Preferred Collaboration Types

Items to be Submitted

Background
Barium titanate (BaTiO3) is one of the electronic materials widely used, for example, as a dielectric in multi-layer ceramic capacitor, since it has high relative permittivity. With achieving further downsizing and higher functionality of electronic components, demand for nanomaterials with high uniformity have been increasing.

In addition to barium titanate, various methods to synthesis of highly uniformed other metal oxides nanoparticles has been studied in response to above electronic components development trends. Several studies also focus on synthesis of highly uniformed perovskite oxide submicronparticles or nanoparticles.

Therefore, the client had issued this open request all over the world to accelerate development of such technologies.

Notes on Response
Proposal shall have clear points and should not include confidential information. Supplemental files may be submitted in addition to the proposal.

Response evaluation
The client will evaluate all responses with the following criteria.

- Overall scientific and technical merit
- Approach to proof of concept or performance
- Economic potential of concept
- Realism of the proposed plan (action items, timeline, roles, deliverables, cost estimation)
- Potential for proprietary position
- Respondents’ capability and related experiences

Anticipated Project Process
After the submission due date, the client will review all submitted proposals. NineSigma will send the review results to each proposer 6-8 weeks after the due date. The client possibly asks clarifying questions before selecting the most suitable candidates for collaboration. The client will select best candidates through evaluations. During the selection process, the client may execute NDA with selected respondents, seek further information disclosure, and discuss specific development targets or potential opportunities. The client will execute necessary agreements with the selected respondents and move to the advanced development phase. Specifics of any collaboration will be determined through consultation with the concerned parties.

Award Amount

Attachments

<table>
<thead>
<tr>
<th>Name</th>
<th>Creation Time</th>
<th>Size</th>
<th>Created By</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdditionalInformationSheet...</td>
<td>Jan 31 at 01:47 AM</td>
<td>257.58 kB</td>
<td>Kimihiro Tanaka</td>
</tr>
<tr>
<td>RFP_2019_0009.pdf</td>
<td>Feb 14 at 03:42 AM</td>
<td>179.86 kB</td>
<td>Tomoko Kanamori</td>
</tr>
</tbody>
</table>

Request Number

RFP_2020_0009

Picture