TECH NEED

Seeking Technologies to Convert CO2-Derived Methanol to Polyoxymethylene

KEY INFORMATION

TECHNOLOGY CATEGORY:
Sustainability - Low Carbon Economy
Chemicals - Polymers
Materials - Plastics & Elastomers

TECHNOLOGY READINESS LEVEL (TRL): TRL4 TO TRL7
COUNTRY: SINGAPORE
ID NUMBER: TN174492

BACKGROUND/DESCRIPTION

Polyoxymethylene (POM) is a high-performance engineered thermoplastic widely used in the automotive, electronics, and industrial sectors due to its excellent mechanical strength, chemical resistance, and dimensional stability. However, its conventional production relies heavily on formaldehyde derived from fossil-based methanol, presenting significant sustainability and carbon footprint challenges.

Amid growing environmental concerns and global net-zero commitments, carbon dioxide (CO_2) utilisation is emerging as a promising approach for transforming waste carbon into value-added materials. Among various CO_2-derived chemicals, methanol stands out as a viable and sustainable feedstock, offering a low-carbon alternative to traditional petrochemical-based inputs.

To advance circular economy goals and reduce reliance on fossil resources, a Singapore-based SME is seeking innovative and scalable technologies that can convert CO_2-derived methanol into POM or its intermediates such as formaldehyde or trioxane.

For more information, contact techscout@ipi-singapore.org

Proposed solutions may include end-to-end pathways using commercially viable CO_2-derived methanol to produce POM, or novel routes that directly convert CO_2 into POM through intermediate steps.

TECHNOLOGY SPECIFICATION

The proposed technology should meet one or more of the following criteria:

- Utilises CO_2-derived methanol as the primary input, with preference for solutions compatible with industry-grade CO_2-methanol requiring minimal purification
- Covers full conversion from methanol to POM, including polymerisation to produce high molecular weight POM and minimal production of undesired by-products or waste
- Adaptable or integrable with existing chemical processing infrastructure
- Demonstrates significant carbon footprint reduction compared to conventional fossil-based POM production
- Offers a cost structure that is competitive with or has potential to outperform traditional POM production routes
- Preferred TRL 4-7 with opportunities for the tech seeker to license the technology for commercialization
- Should have the potential to initiate early customer testing with CO_2-derived POM within 24 to 36 months (negotiable)
- Technologies able to directly convert CO_2 into POM or intermediates e.g., formaldehyde, trioxane are also of interest

WHAT WE ARE NOT INTERESTED IN

- Non-CO_2 pathways to produce POM or its intermediates (e.g., formaldehyde, trioxane) that do not incorporate CO_2-derived methanol or other forms of carbon capture and utilisation
- Technologies limited to CO_2 capture and conversion into methanol without downstream processes such as intermediate synthesis or polymerisation into POM
- Low-TRL concepts (≤ TRL 3) with limited validation or lacking a clear development pathway toward industrial application

PREFERRED BUSINESS MODEL

- Business Collaboration (Joint Venture)
- IP Acquisition
- Licensing
- R&D Collaboration