



TARGET™

TAR REFORMING CATALYSTS

Biomass gasification and waste-to-energy processes offer renewable energy paths for the emerging global energy infrastructure. Using low value feedstocks (solid municipal and agricultural waste), these processes use high temperature reactions to generate syngas streams for energy and chemical synthesis.

A problematic by-product of the gasification process is tar, which is entrained in the product stream and can foul expensive downstream process equipment, whether the moving parts of energy generation equipment or sensitive downstream catalyst beds.

NEXCERIS' catalyst eliminates these tars and reduces the cost of gasification. The catalyst breaks the bonds of the tar to generate more syngas, adding value to the process stream.

NEXCERIS works with customers world-wide to develop new catalyst technologies and products. We identify applications where end users could be better served by innovative catalysts and new product designs--and coordinate with customers to provide new solutions.

Leveraging a portfolio of catalyst intellectual property and manufacturing know-how, we create products that perform better, simplify operations and save money. We work closely with our customers from the concept stage to the product installation to achieve amazing results.

Our client list includes Fortune 500 companies and U.S. National Laboratories, along with leading developers in the energy and environmental markets.

**TARGET™ CONVERTS TAR FROM A
DOWNSTREAM PROBLEM TO A DOWNSTREAM
PRODUCT**

NEXCERIS

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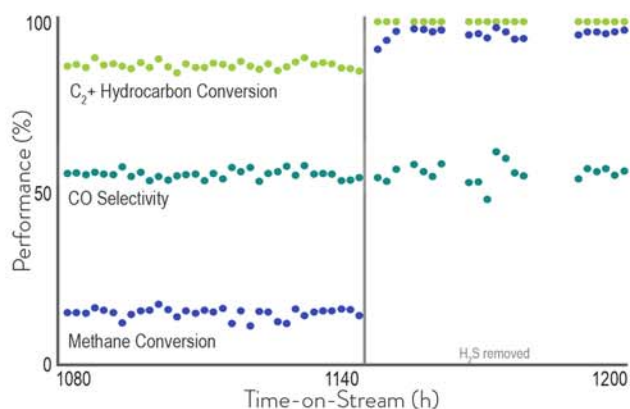
Non-PGM catalyst formulations for use in bio-gasification and waste-to-energy tar clean-up

Excellent stability, coking resistant and tolerant of typical sulfur concentrations found in gasified biomass streams

Demonstrated stability in presence of sulfur, ammonia and other anticipated contaminants

NEXCERIS' TARGET™ tar reforming catalyst is a proprietary base metal oxide that converts byproduct tars that can foul downstream equipment into useful syngas product. Even in the presence of common poisons like H₂S and ammonia, TARGET™ catalyst continues to destroy tars, protecting downstream investments and increasing product yield.

The catalyst is designed to provide high performance at 800°C and has the ability for reform other hydrocarbons in the gas stream. As shown below, the catalyst achieves excellent performance and recovery from H₂S and NH₃ exposure.

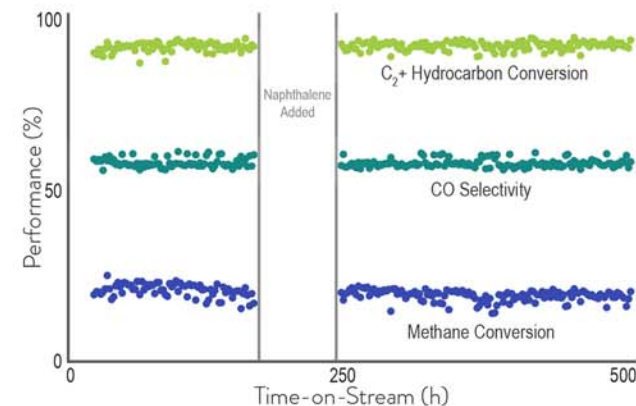


Gasification Process

TARGET™ catalysts were originally designed for reforming biomass gasification products, but has been shown to work equally well on MSW gasifier product streams. TARGET™ reforms tar and light hydrocarbons to CO and H₂ by steam- and dry-reforming mechanisms, enabling efficient production of syngas for power generation, and the manufacture of liquid fuels and chemicals.

Unlike conventional Ni-based catalysts which are deactivated by sulfur, TARGET™ catalyst is very stable in the presence of H₂S and NH₃, two impurities in gasified biomass. Its sulfur tolerance is attributed to the novel catalyst formulation and unique synthesis approach.

The lower operating temperature, high performance, and sulfur tolerance of the TARGET™ catalyst reduces the required energy input compared to competing catalysts, which run at higher temperatures to mitigate sulfur poisoning effects.



Reforming of biomass gasification products on a catalyzed monolith in the presence of H₂S

The tar reforming catalyst can be manufactured as fine powders and granules, and washcoated on monolith substrates.

