Alkoxides for Biodiesel

EVONIK
Leading Beyond Chemistry

From renewable feedstocks to Biodiesel

Transesterification

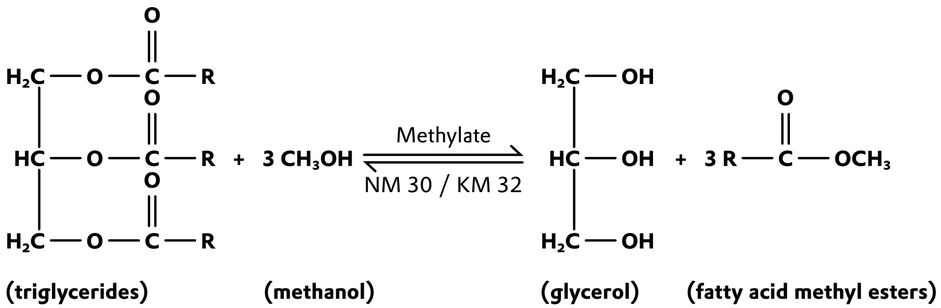
Feedstocks from vegetable oils, as well as animal fats consist of triglycerides, which are the combination of the trivalent alcohol glycerol with three fatty acids. However, the molecular structure of these feedstocks in their pure form recludes their use for conventional combustion diesel engines.

The key is to replace the trivalent glycerol with three monovalent methanol molecules. This transforms the viscous feedstocks into a fuel with excellent flow characteristics: biodiesel. And all it takes is a simple chemical reaction called transesterification, which involves methanol and a small quantity of an alkaline catalyst.

Here, sodium methylate 30 % solution in methanol **(NM30)** and potassium methylate 32 % solution in methanol **(KM32)** from Evonik have become the industry's preferred choice.

The feedstock quality determines the efficacy and cost-efficiency of these catalysts. To prevent undesired side effects, such as soap formation, or increased catalyst consumption, the crude feedstock should be refined to reduce water and free fatty acid (FFA) content.

In addition to biodiesel, transesterification also yields glycerol as a valuable by-product for the pharmaceutical and cosmetics industry.



The cost-efficient choice for Biodiesel production

High-performance catalysts in the transesterification process

Alkoxides have been used to transesterify vegetable oils since 1852. With the growing importance of biodiesel, the process has been optimized to the extent that now various raw vegetable oils can be transesterified to biodiesel and glycerol with higher yields and better product quality. Here alkoxides from Evonik are making the difference.

As the worlds leading producer of specialty chemicals, we offer advanced catalyst solutions specifically designed to address the requirements of producing biofuels. The added value: high yield, simple, safe handling in a closed circuit combined with significant gains in efficiency and productivity.

NM 30 and KM 32: the leading catalysts

Sodium methylate 30 % solution in methanol **(NM 30)** is the leading component in the transesterification of vegetable oils. For processes using raw material with an FFA content of more than 1.0 %, such as used cooking oils or animal fats, Evonik proposes potassium methylate 32 % solution in methanol **(KM 32)**. Both catalysts can be used in anhydrous production processes and directly from the storage tank – in a closed circuit and without any additional intermediary steps. This reduces handling risks to an absolute minimum. Alkoxide catalysts **NM 30** and **KM 32** are also the preferred choice because of their cost-efficiency. Supplied ready for use, they save an entire production step in the making of biodiesel fuel that would otherwise be required for dissolving the catalyst in the methanol. The powerful alkoxides from Evonik also pay off by increasing biodiesel yields by 2 to 5 %, and generating higher-purity glycerol. The latter is actually obtained with a technical purity of 80 to 85 %. The higher purity makes an important contribution to the cost-effectiveness of a biodiesel plant.

Evonik Alkoxides - the expert partner

Service: expect a lot

Biodiesel catalysts from Evonik are backed by the roughly 50 years of expertise in manufacturing alkoxides, plus more than 20 years of experience in addressing various challenges of the biodiesel industry. They are also the result of significant investments in research and development, especially with a focus on biodiesel based on promising second-generation raw materials, such as used cooking oil or tallow. But most importantly, behind our market leading alkoxides you have the minds of the people at Evonik, who are excited about their work, and support you with knowledge and experience – whether in application engineering, specification compliant production of biodiesel, or optimizing production facilities. The analytical lab of Evonik, with all its technical facilities, from chromatography to titration and more fuel related analyses, is also at your disposal to make your product meet all relevant specifications.

Proximity: the advantage of a global partner

The close proximity of our production facility offers a significant advantage, catering to both your routine operations and any unforeseen bottlenecks that may arise. With a global presence spanning across 50 countries, including the Americas, Asia, and Europe, we ensure exceptional accessibility and swift response times. Furthermore, our extensive reach guarantees seamless communication, as our multilingual team is well-versed in serving clients from diverse regions, regardless of the location of your biodiesel plant.

For more information please visit us at: evonik.com/catalysts

▸ Directlink

Alkoxides

Speed up your chemistry

Why Evonik?

- **Our supply chain** is designed to efficiently serve our **local and global** customers starting from three independent production sites
- **Our biodiesel portfolio** covers a broad spectrum of outstanding products
- **Our team passionately creates value** making Evonik not only a supplier of Alkoxides **but a solution provider** to our partners
- **Our target** for the future is to contribute on the **reduction of GHG** emissions securing high sustainability in the value chain

Technical support

- **On-site assistance** during implementation of new technology as well as **process optimization and troubleshooting**
- Evaluation of **effectiveness** and **efficiency** with competent consideration of all production facets
- **Simulation** of industrial processes on laboratory scale as well as analytical services
- Constant dialogue with customers for **innovation**
- **Handling and safety training** according to Responsible Care®

EVONIK OPERATIONS GMBH
Business Line Catalysts
catalysts@evonik.com
www.evonik.com/catalysts

North America
Evonik Corporation
Business Line Catalysts
1700 City Place Dr., Suite 510
Spring, TX 77389
USA
Phone +1 973 307-6341

Brazil
Evonik Brazil Ltda.
Business Line Catalysts
Rua Arquiteto Olavo Redig
de Campos 105
Torre A – 13º e 14º andar
04711-904 - São Paulo - SP
Brazil
Phone +55 11 3146-4155

Argentina
Evonik Metilatos SA
Business Line Catalysts
Darragueira 38
B1609HDB Buenos Aires
Argentina
Phone +54 9 11 3499-0202

Europe
Evonik Operations GmbH
Business Line Catalysts
Rodenbacher Chaussee 4
63457 Hanau-Wolfgang
Germany
Phone +49 6181 59-13399

Asia
Evonik Singapore Specialty
Chemicals Pte Ltd
3 International Business Park
#07-18 Nordic European Centre
Singapore, 609927
Phone +65 6809 6516

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