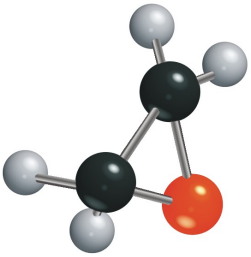
MEXEO®
47-225 Kędzierzyn-Koźle, Poland
ul. Energetyków 9
tel./fax +48-77-487 38 10
www.mexeo.pl, mexeo@mexeo.pl



OFFERED :

UNCONVENTIONAL OXYALKYLATION CATALYSTS AND TECHNOLOGY SOLUTIONS

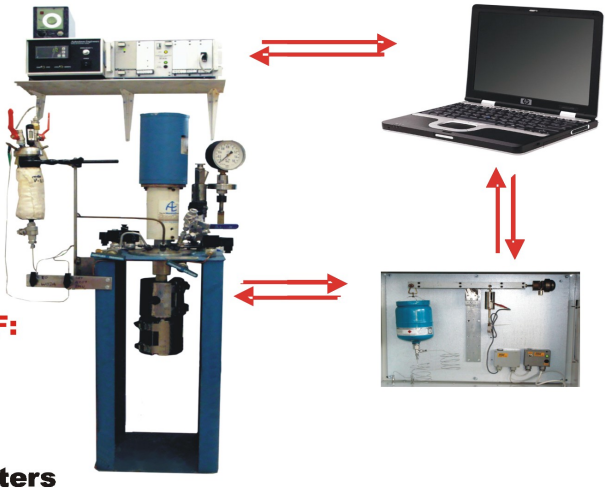
CALIUM CATALYST
MEO-Ca
RARE EARTH METAL
HOMOGENEOUS
PROMOTES →
ETHOXYLATION OF :
- ALKOHOLS
- ESTERS

LANTHANUM CATALYST
MEO-La
COORDINATIVE
HETEROGENEOUS
PROMOTES →
ETHOXYLATION AND PROPOXYLATION OF :
- ALKOHOLS

COBALTIUM - CATALYST
MEO-DMC
DI-METAL CYANIDE TYPE
PROMOTES →
HIGH MOLECULAR PROPOXYLATION OF :
- POLYOLS

AVAILABLE
LABORATORY SERVICE
ETOXYLATION
AND PROPOXYLATION

EXPERTISE
IN OXYALKYLATION



DIRECT ETHOXYLATION OF:
- fatty acid methyl esters
- vegetable oils
- animal fats
- and the other variable esters

Catalytic activity

Table 1. Comparative statement of activity of the offered catalyst

	Oxyethylation			Oxypropylation		
Dodecanol	NaOH	MEO-Ca	MEO-La	NaOH	MEO-Ca	MEO-La
Methyl dodecanoate	NaOH	MEO-Ca	MEO-La	Na^+	MEO-Ca	MEO-La

Active Legend: Not active

Operating parameters

- Temperature range : 120¸185oC;
- Overpressure range : 0.3¸0.5 MPa
- Concentration: 0.5%, per product wt.

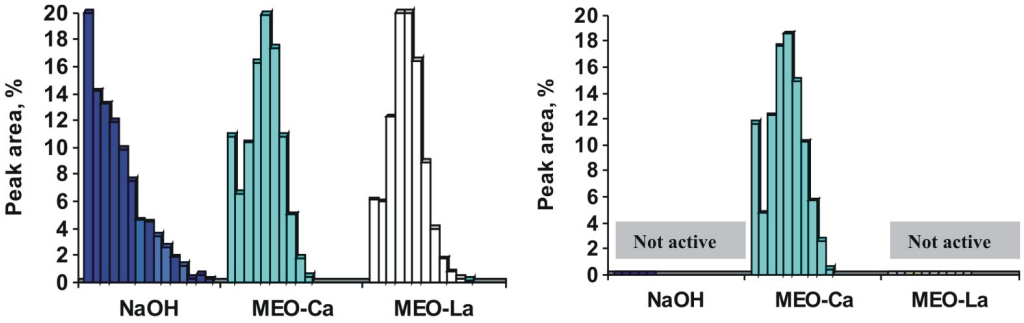


Fig. 1. Fractional composition of oxyethylated a) dodecanol and b) methyl dodecanoate, as obtained with in the presence of the homogeneous calcium catalyst (MEO-Ca), the heterogeneous lanthanum catalyst (MEO-La) and NaOH as the conventional homogeneous alkaline catalyst, respectively, at molar ratio of oxirane to hydrophobe $N_{av.}$=4

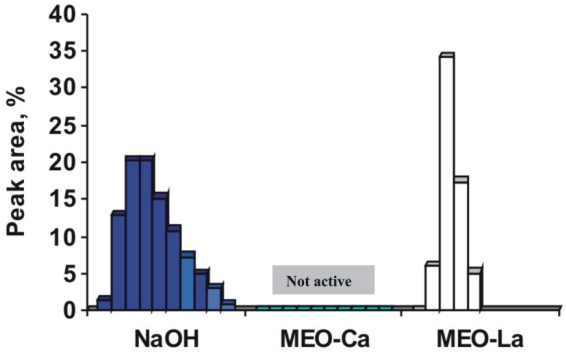


Fig 2 .Fractional composition of oxypropylated dodecanol as obtained with homogeneous calcium catalyst (MEO-Ca), heterogeneous lanthanum catalyst (MEO-La) and NaOH as the conventional homogeneous alkaline catalyst, respectively, at at molar ratio of methyoxirane to hydrophobe $N_{av.}$=4

MEXEO WIESŁAW HRECZUCH
ul. E N E R G E T Y K Ó W 9
47–225 KĘDZIERZYN-KOŹLE

Tel.: + 48 – 77 – 487 38 10
Fax.: + 48 - 77 - 487 38 11

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NIP 749–137–55–74
REGON 532327597

DMC (double metal cyanide) catalyst

- DMC catalyst used for epoxide polymerization, that is, for polymerizing alkylene oxides such as propylene oxide and ethylene oxide to yield high molecular weight polether polyols.
- In conventional base catalyzed oxyalkylation reaction, propylene oxide and certain other alkylene oxides are subject to a competing internal rearrangement that generates unsaturated alcohols. The resulting products will contain allyl alcohol initiated, monofunctional impurities. The monofunctional impurities tend to reduce the average functionality and broaden the polydispersity of the polyols.
- Compared with similar polyols made using conventional basic catalyst, polyether polyols made from the DMC catalyst have low unsaturations, narrow molecular weight distributions, can have high molecular weight, and are useful in making a variety of polyurethane products.
- Moreover this catalyst can be used with less amount (ppm) and reaction time of polymerization is reduced largely.

An exemplary record from dynamic trends of the reaction parameters during the control activity test of MEO-DMC catalyst is presented in Fig. 2.

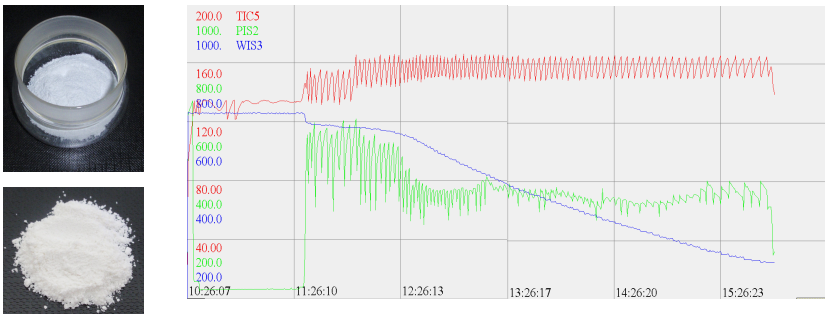
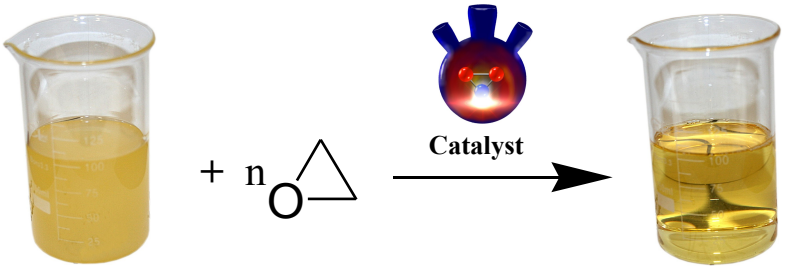


Fig. 2. Activity control test of MEO-DMC catalyst during propoxylation of polypropylene glycol 450, at 66 ppm concentration, where: **blue line means weight of alkylene oxides in feeding vessel, red line denotes temperature, green line sets pressure during synthesis.**

The synthesis was performed in a computerized 1 dm^3 laboratory reactor equipped with PLCS system, mechanical stirrer, heating jacket and cooling coil. The reaction temperature was 130ºC and overpressure 0,3 – 0,6 MPa.

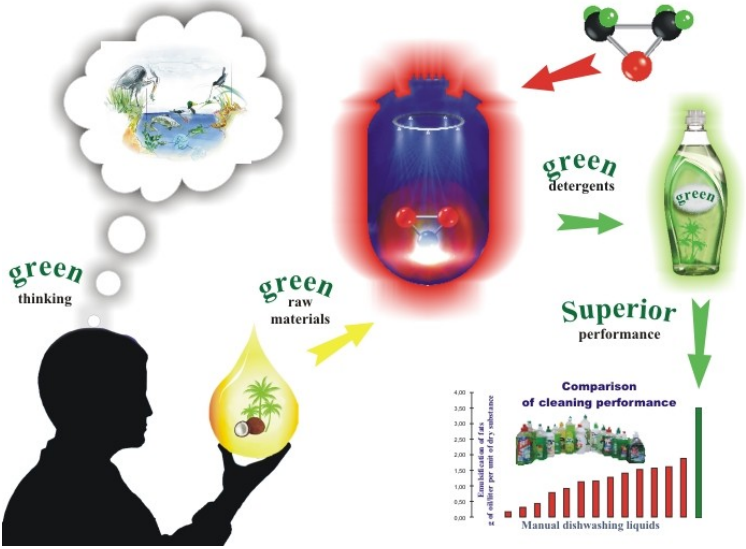
OXAD K 251
NEW ETHOXYLATE
OF VEGETABLE OILS



Starter oil

Ethoxylation product after final treatment

A GREEN CONCEPT OF SYNTHESIS AND APPLICATION

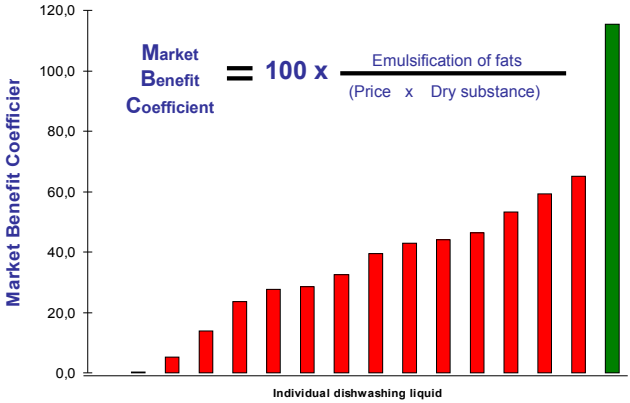


Information: marketing@icsochp.com.pl, mexeo@mexeo.pl

OXAD K 251
DISHWASHING APPLICATION

16 brands of hand dishwashing liquids were evaluated, which were purchased from the market and well represented the product sector.

The comparative criteria included their price in big markets, cleaning performance, dry substance, foaming and viscosity.
It was shown, that the dishwashing formulation containing ethoxylated oils - OXAD K 251 (green bar) exhibited superior performance properties, compared to the existing market offer. Based on the obtained results, ranking of the investigated products was presented comparing their profitability of production, attraction for consumers and quality of the formulations.



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