Dilactamate - Katchem®

Dilactamate - Katchem "S"

Product Description

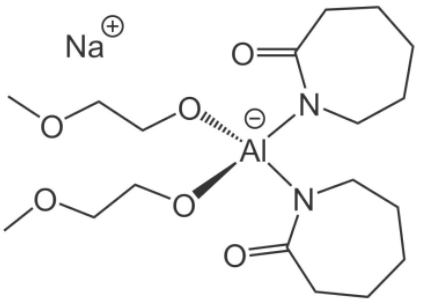
Introduction

Dilactamate-Katchem® and Dilactamate-Katchem "S" are superior initiators for the anionic polymerization of caprolactam to PA-6.
Their main advantage over other catalysts such as sodium lactamate is very high tolerance to moisture, which allows reducing costs by using technical grade caprolactam and working without the protection of inert gas.
The resulting polymer shows increased toughness, resistance to low temperature and very low internal stress. The typical products are rods, plates, cylinders, gears, pulleys or semi-finished products such as insulated rail joints. High abrasion resistance makes PA-6 the material of choice for machinery parts in the mining industry and similar applications.

Dilactamate-Katchem "S" is a second generation initiator, which was developed especially for large castings, where the exothermic reaction and crystallization can cause local overheating and formation of inhomogeneities and bubbles. The special composition reduces the risk of overheating and leads to overall better homogeneity of the resulting polymer.
It uses the same dosage and handling as Dilactamate-Katchem® and has no known disadvantages compared to this original, well established initiator.

Technical Specification

Chemical Composition:*
82 ± 2 % sodium dicaprolactamato-bis-(2-methoxyethoxy)aluminate
15 ± 3 % toluene
4 ± 3 % caprolactam



$Na[CH_3O(CH_2)_2O]_2[(CH_2)_5CON]_2Al$

Physical Properties:*

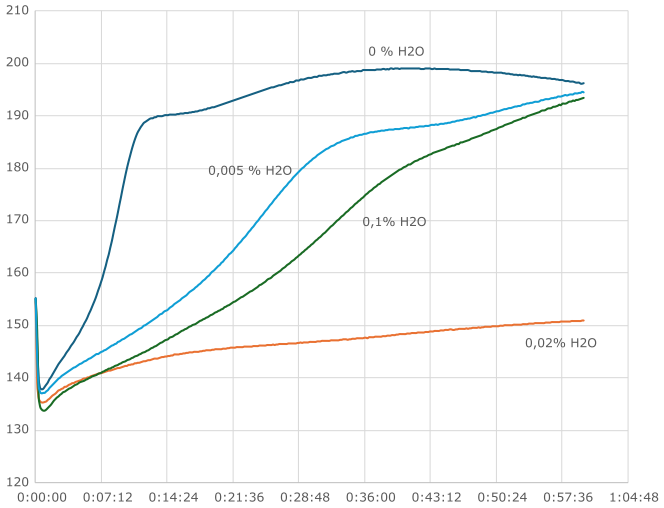
Appearance:	Pale-yellow viscous liquid
Viscosity at 20 °C:	1800 - 6000 mPa.s (cP)
Density:	1110 kg/m^3
Freezing point:	- 20 °C
Flash point:	22.5 °C
Decomposition temp.:	225 °C

*Applies to both Dilactamate-Katchem® and Dilactamate-Katchem "S". Dilactamate-Katchem "S" contains a small amount (~0.2%) of magnesium caprolactamate additive, which has no impact on physical properties, dosage or material handling.

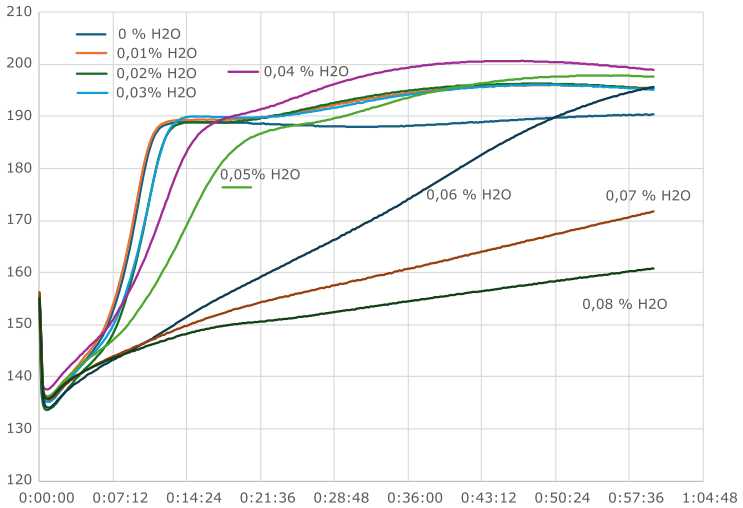
Resistance to Moisture

Water is known to efficiently block the catalytic activity of sodium caprolactamate based initiators. Humid air in the facility or sub-optimal raw material storage conditions is usually enough to cause difficulty in the technology of casting PA-6G, causing high percentage of defective pieces.
Dilactamate-Katchem® and Dilactamate-Katchem "S" initiators both exhibit resistance to moisture up to 10 times higher than other commonly used initiators such as sodium caprolactamate (CL-Na)*:

1.5% CL-Na Initiator



1.5% Dilactamate-Katchem®



The above temperature curves (°C vs. time) show that when using a common sodium caprolactamate initiator (CL-Na), 0.005% moisture in the monomer is enough to cause severe retardation, while 0.02% water content leads to complete failure of the polymerization reaction.
With same dosage of Dilactamate-Katchem®, the results are practically perfect with water content in the monomer up to 0.03%. In the range 0,04% - 0,05% of water content, only slight retardation is observed, with acceptable quality of the cast (no monomer detected in the resulting polymer). As much as 0.06% water needs to be artificially added into the monomer to obtain similar result as was observed with 0.005% water and a CL-Na initiator.

***Experiments were performed using these conditions:**

Freshly distilled caprolactam, total sample size 350 g, stainless steel cylindrical mold 70 mm diameter / 100 mm height, thermocouple in a thin glass tube submerged in the geometrical centre of the mold, temperature of the melt: 135 °C, temperature of the mold/oven: 156 °C, commercial CL-Na activator (c = 1.33 mmol/g of sodium caprolactamate in caprolactam), 0.5 % wt. of commercially available activator Brüggemann C20P.

About Us

Katchem spol. s r. o. was established in 1990 as a spin-off from the Czech Academy of Sciences. It is a modern, innovative company with great research potential. We have successfully completed dozens of joint research projects with a range of research institutions and private companies in our 30+ years history on the market. Our expert team is experienced and highly capable. We research and develop world-class production technologies in the field of special chemical compounds.

Orders and Demands: sales@katchem.cz
Technical Support: krovacek@katchem.cz
Invoicing: office@katchem.cz
General E-mail: info@katchem.cz
Website: *www.katchem.cz*

Katchem spol. s r. o.
E. Krásnohorské 6
110 00 Prague
Czech Republic
VAT No. CZ00548162

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