# CATALYSIS OF BLOCKED ISOCYANATES WITH NON-TIN CATALYSTS

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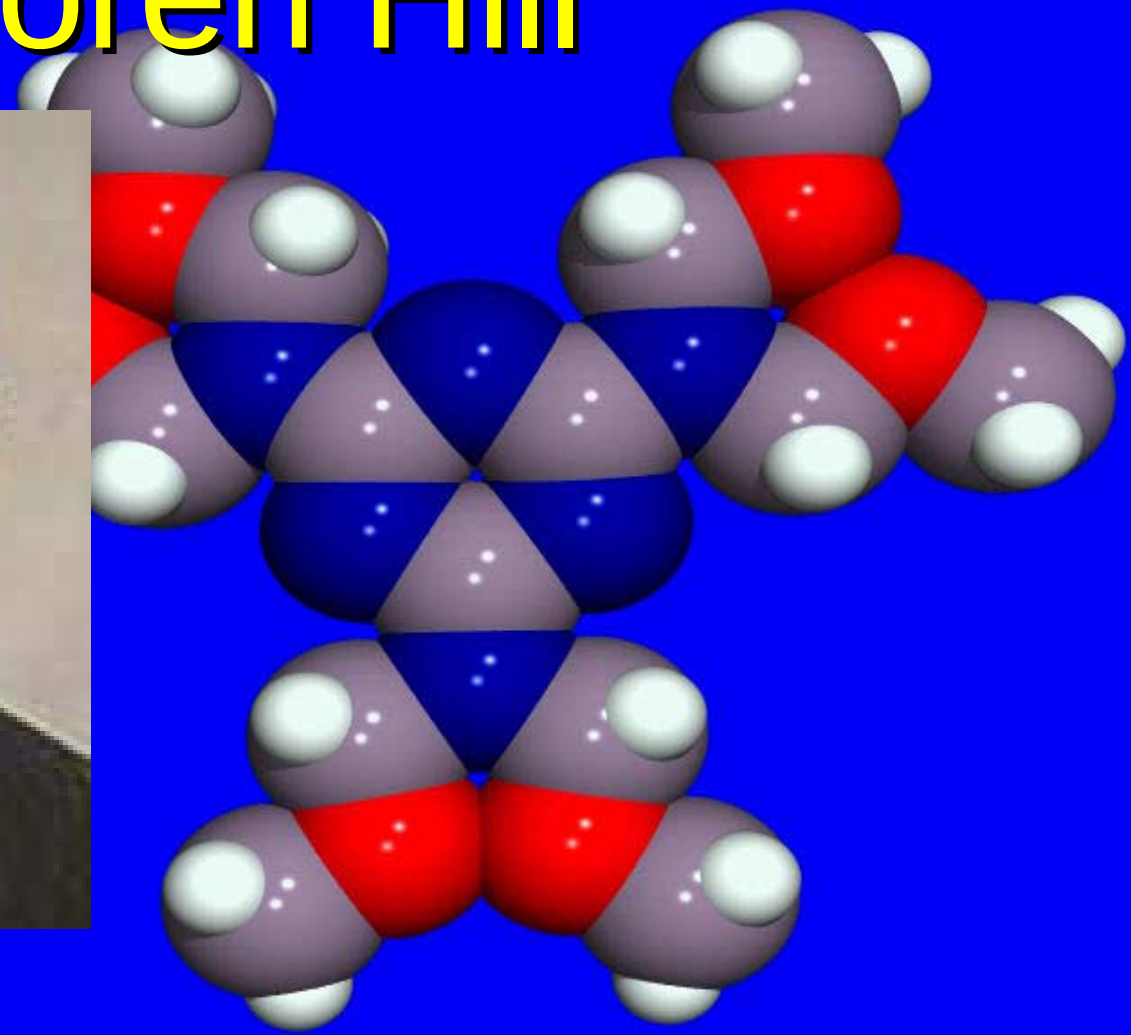
# Dr. Loren Hill



Yes, Loren there is life after HMMM

SL2225

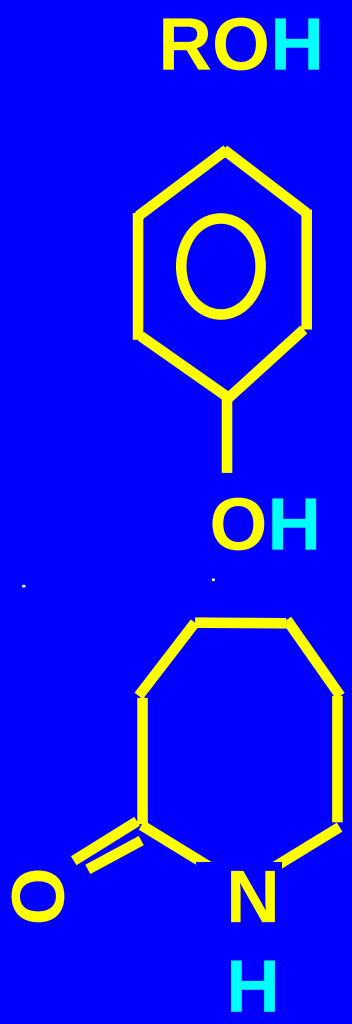
# COMPARISON MELAMINE-BLOCKED NCO

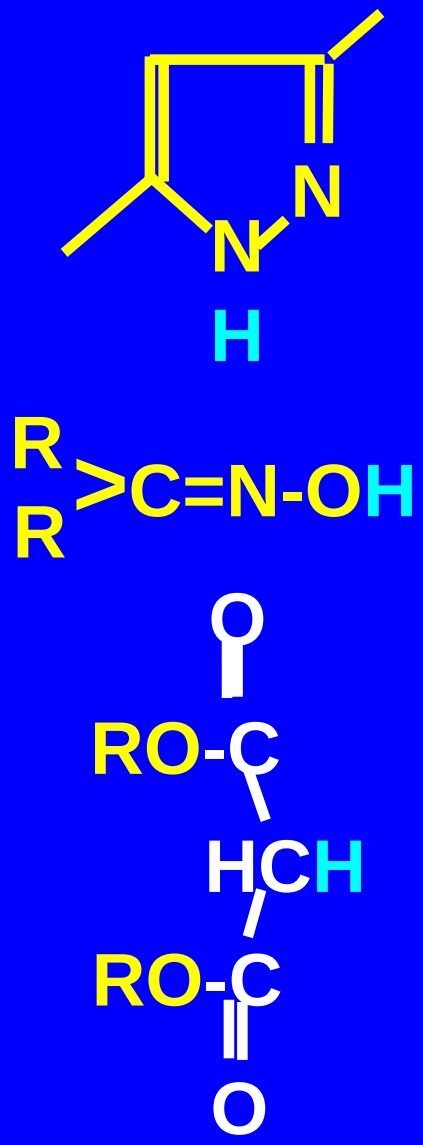
| | HMMM | BL. NCO |
|---|---|---|
| FUNCTIONALITY | 2-5 | 2-3 |
| CATALYST | ACID | DBTDL |
| CURE TEMPERATURE, ºC | 60-200 | 100-120 M*<br>130-200 |
| VOC | MeOH/<br>HCHO | EtOH M*<br>KETOXIME<br>PYRAZOL<br>GLYCOL |
| OVERBAKE | SELFCOND<br>FLEXIBILITY | |
| CHEMICAL SENSITIVITY | ACID | |

M* malonate

SL2226

# BLOCKED ISOCYANATES

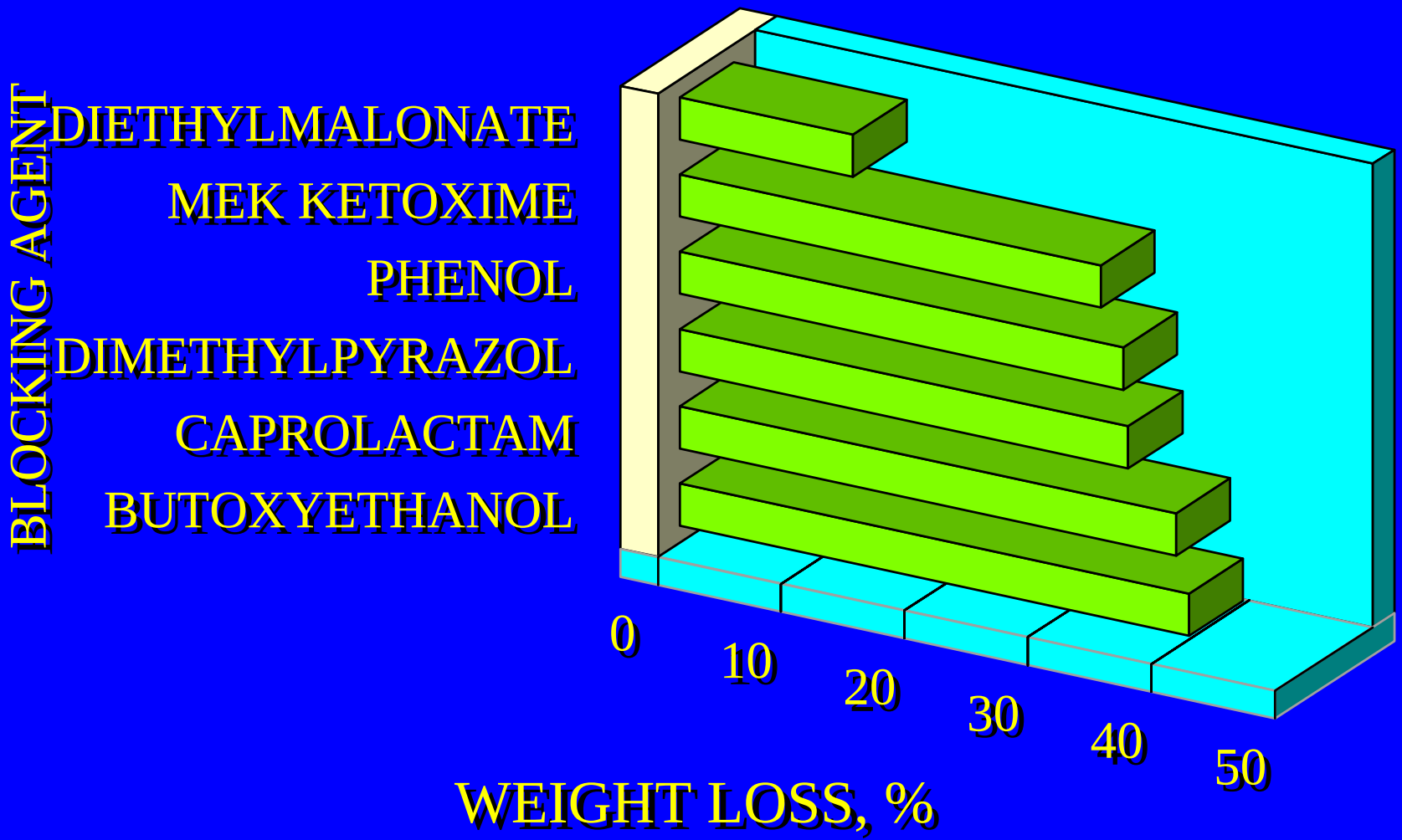



SL2227

# BLOCKED HDI-TRIMER

## WEIGHT LOSS

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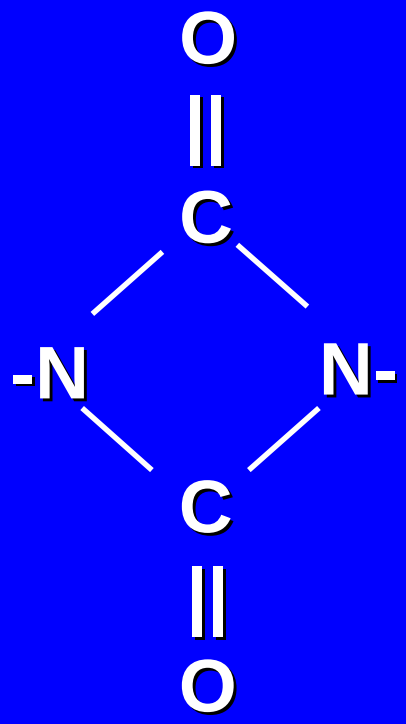
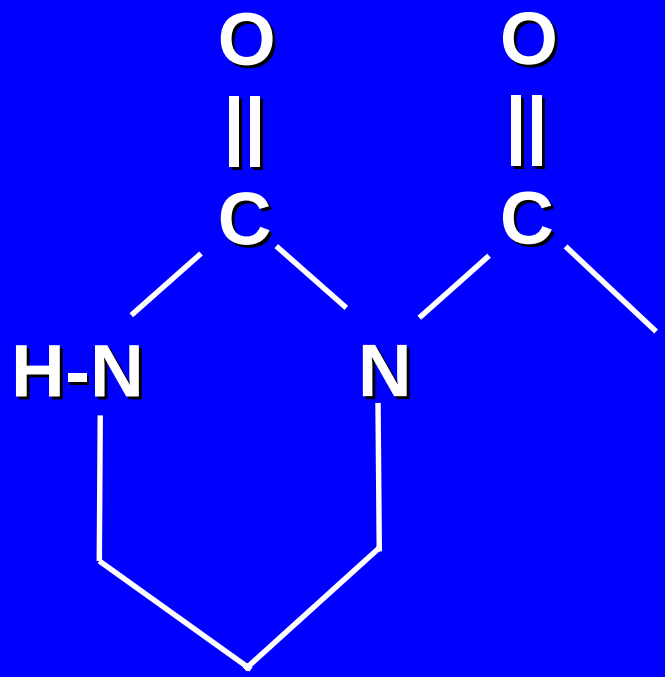
# INTERNALLY BLOCKED ISOCYANATES




**URETDIONE**




**CYCLIC UREA**

SL2228

# APPLICATIONS FOR BLOCKED ISOCYANATES

POWDER COATING

CATIONIC ELECTROCOATING

COIL COATING

AUTOMOTIVE CLEARCOATS

STONE CHIP RESISTANT PRIMER

WIRE COATING

IPDI/LACTAM

URETDIONE

ALCOHOL/TDI

ALCOHOL/MDI

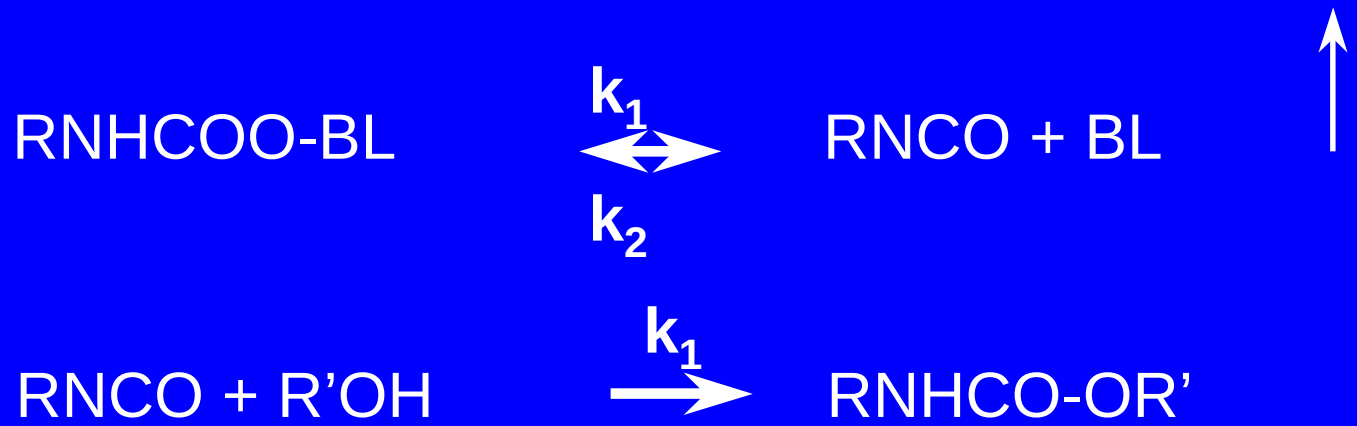
IPDI/HDI BL.

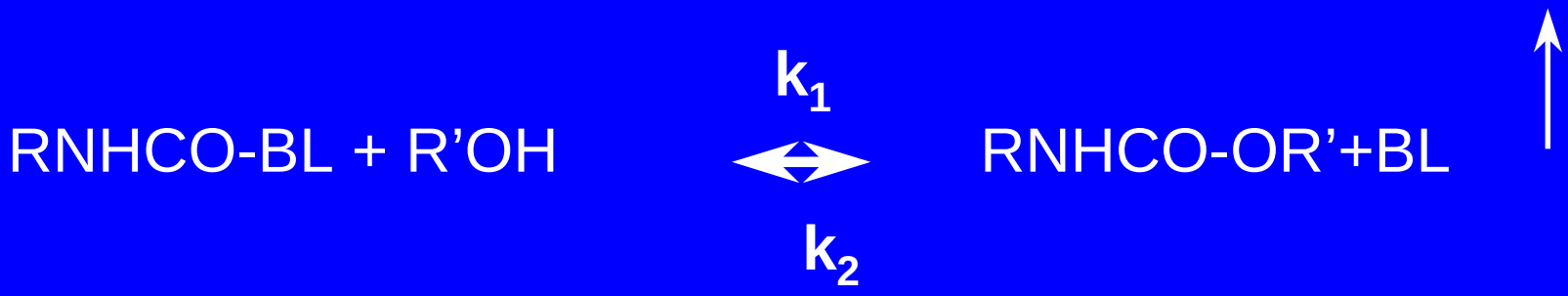
MALONATE

KETOXIME

PHENOL

# REACTION OF BLOCKED ISOCYANATE

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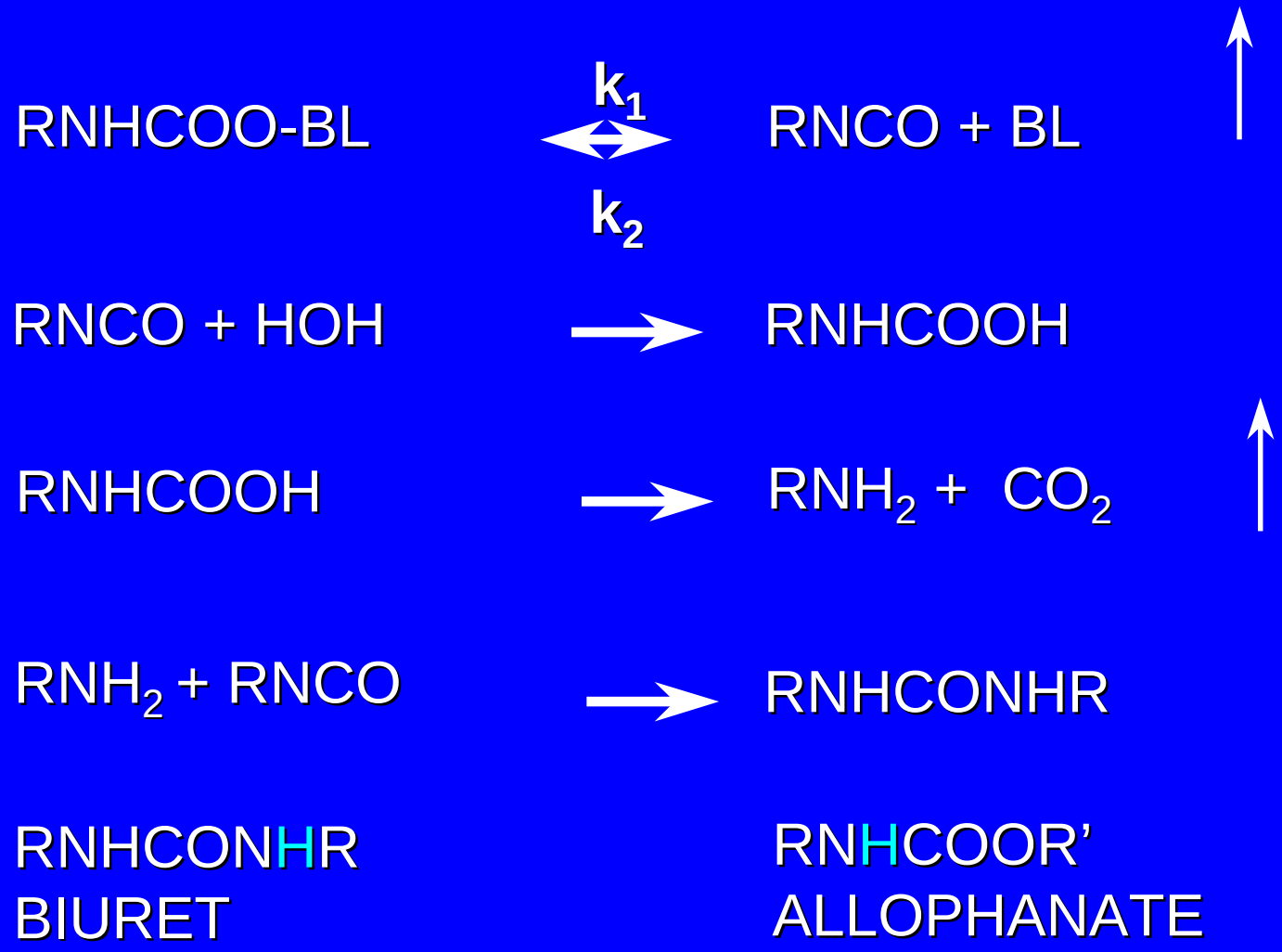
# SIDE REACTIONS OF BLOCKED ISOCYANATE




SL2231

# UNCATALYZED CURE RESPONSE

**ALCOHOL**

**URETDIONE**

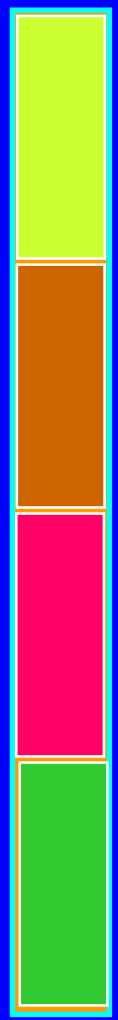
**CAPROLACTAM**

**KETOXIME**

**PHENOL**

**PYRAZOL**

**MALONATE**



**200°C**

**175°C**

**150°C**

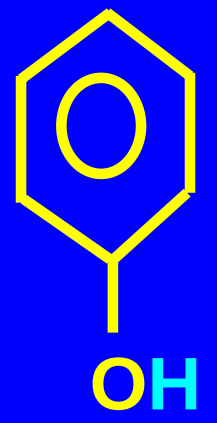
**125°C**

**100°C**

SL2232

# BLOCKED ISOCYANATES

ROH



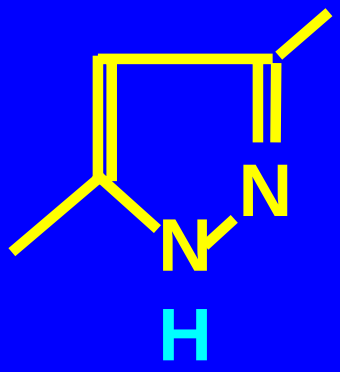

**ELECTROCOATING 180°C**

**WIRE COATING >200°C**

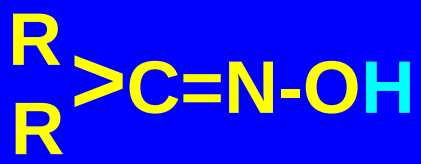

**POWDER COATING >180°C**

SL2233

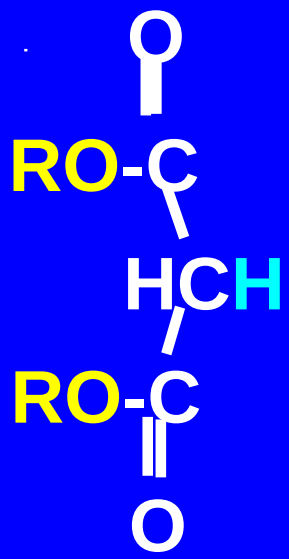
# BLOCKED ISOCYANATES




**TOP COATS >130°C**




**TOP COATS >140°C**

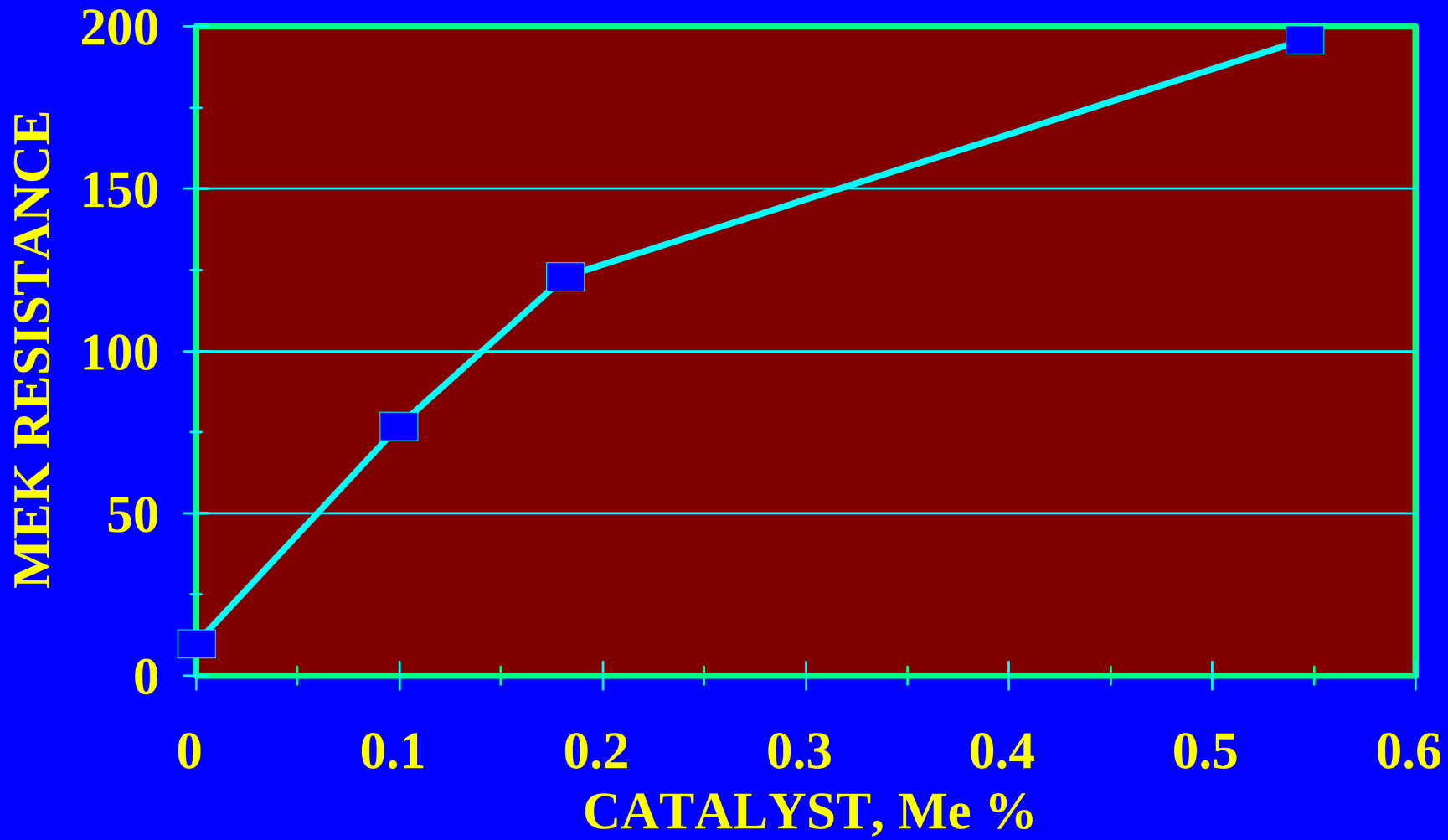



**TOP COATS >100°C**

SL2234

# BLOCKED ISOCYANATE

## RESPONSE TO CATALYST

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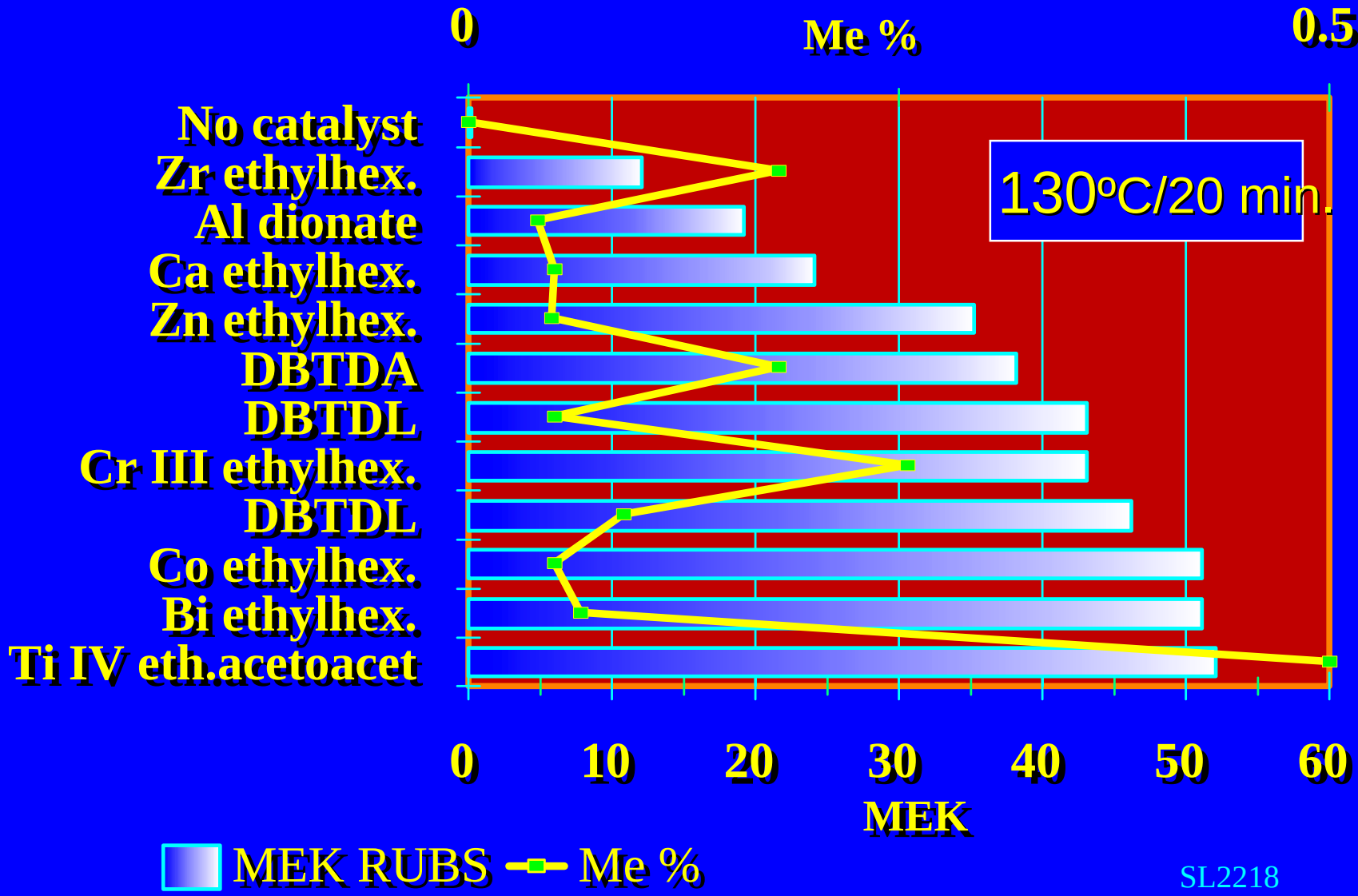
# OXIME BLOCKED ISOCYANATE

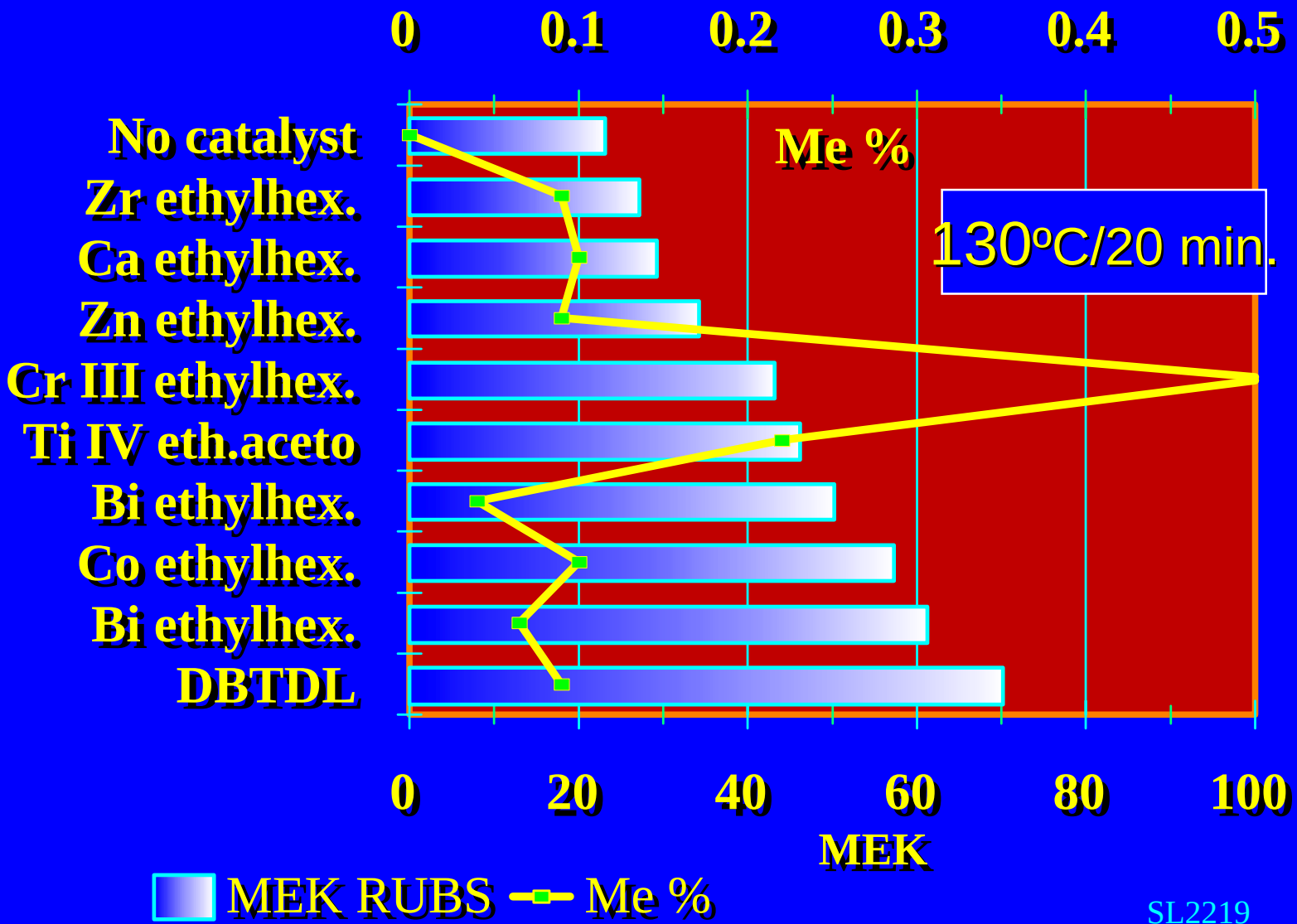
## CATALYST SELECTION




SL2218

# PYRAZOL BLOCKED ISOCYANATE

## CATALYST SELECTION

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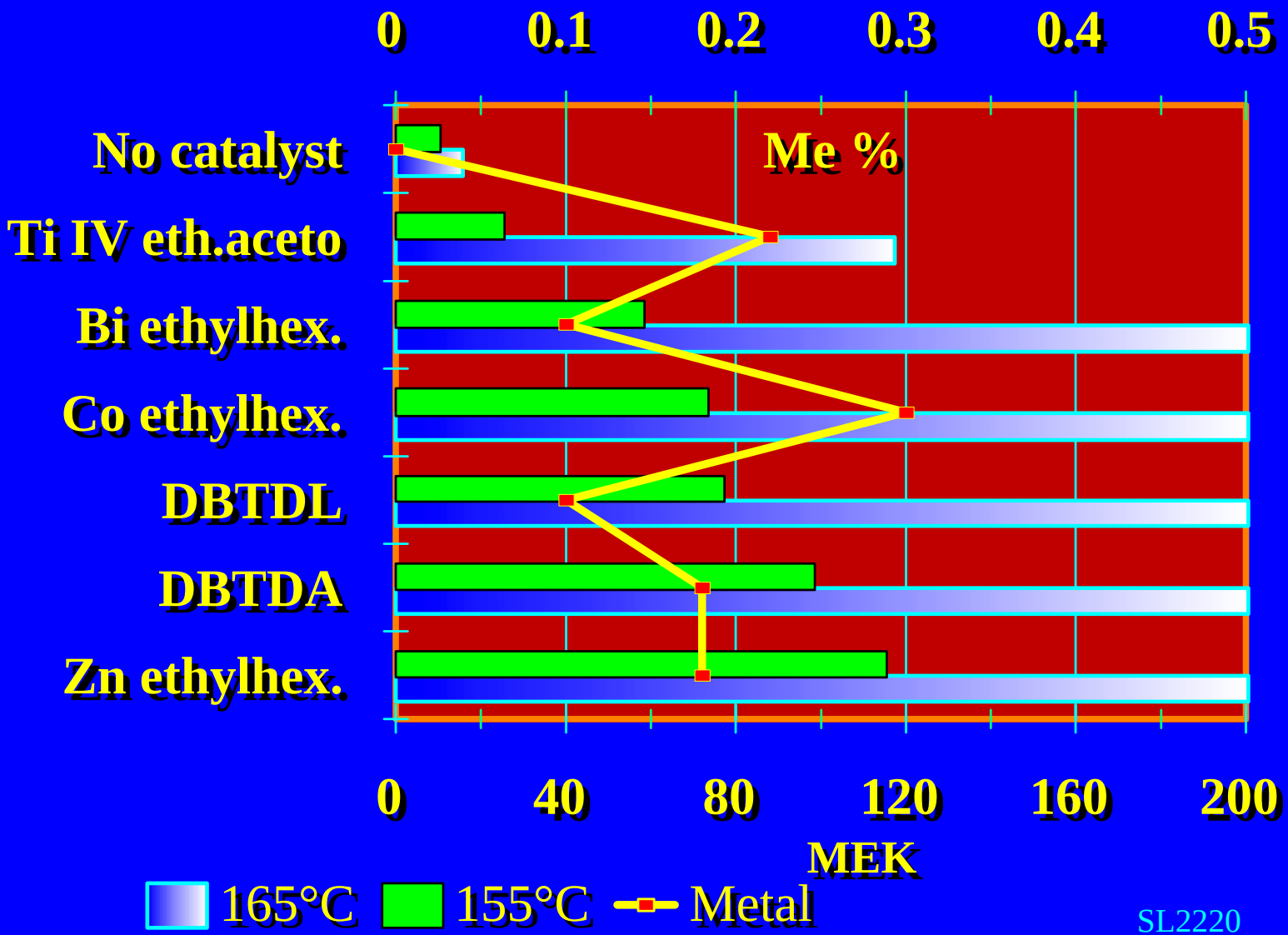
# CAPROLACTAM BLOCKED ISOCYANATE

## CATALYST SELECTION

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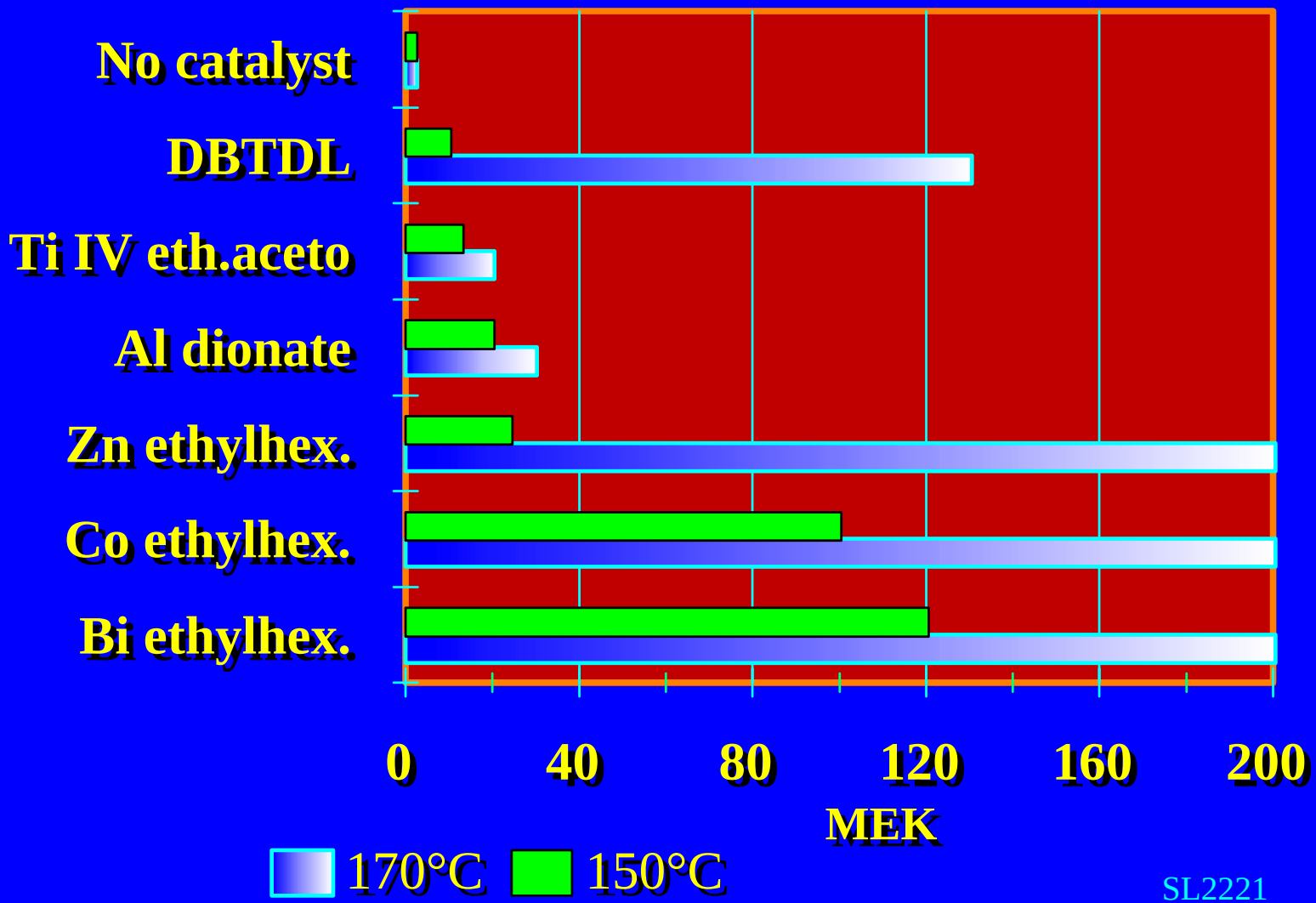
# CARBITOL BLOCKED ISOCYANATE

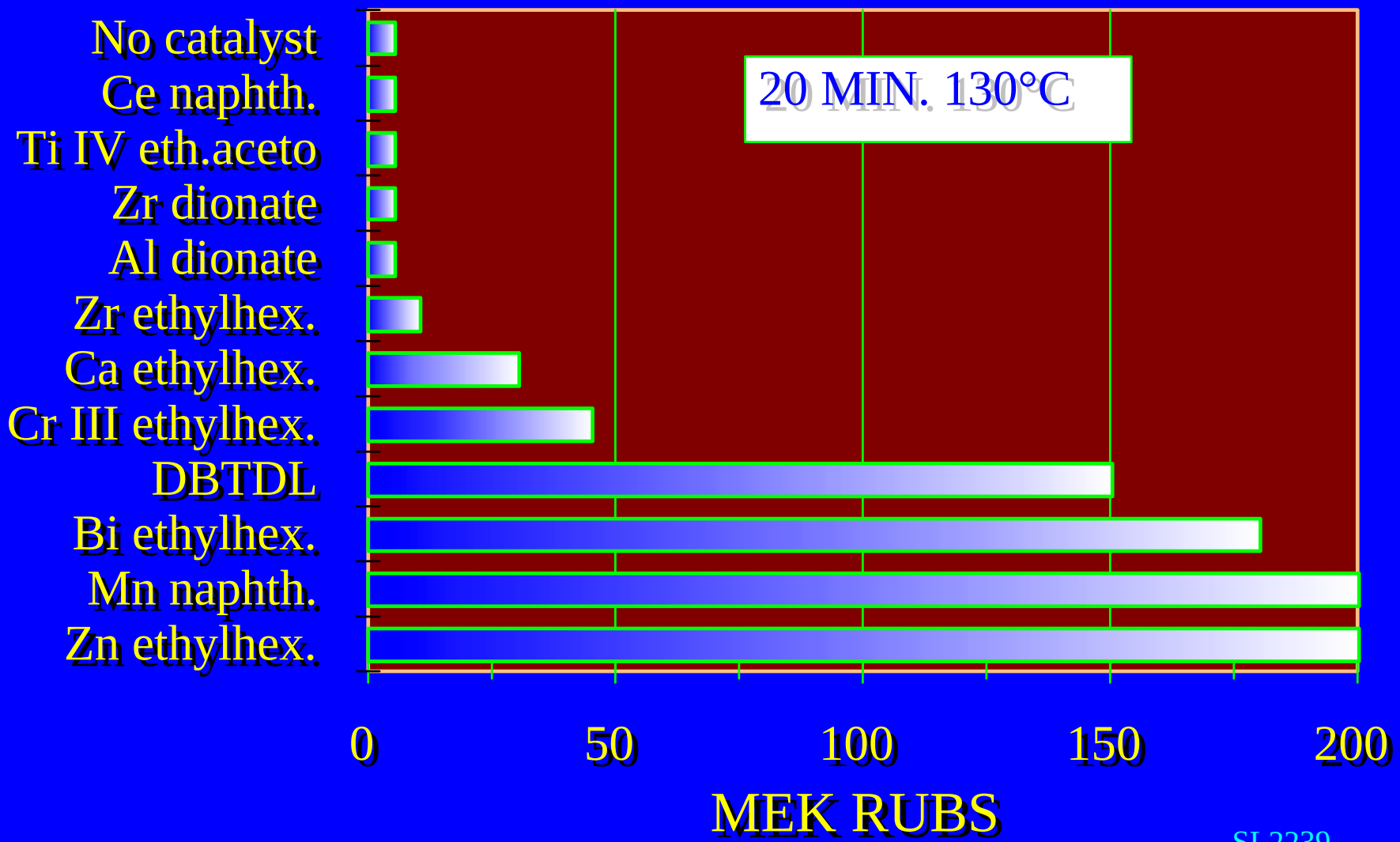
## CATALYST SELECTION, Me 0.18 %




SL2221

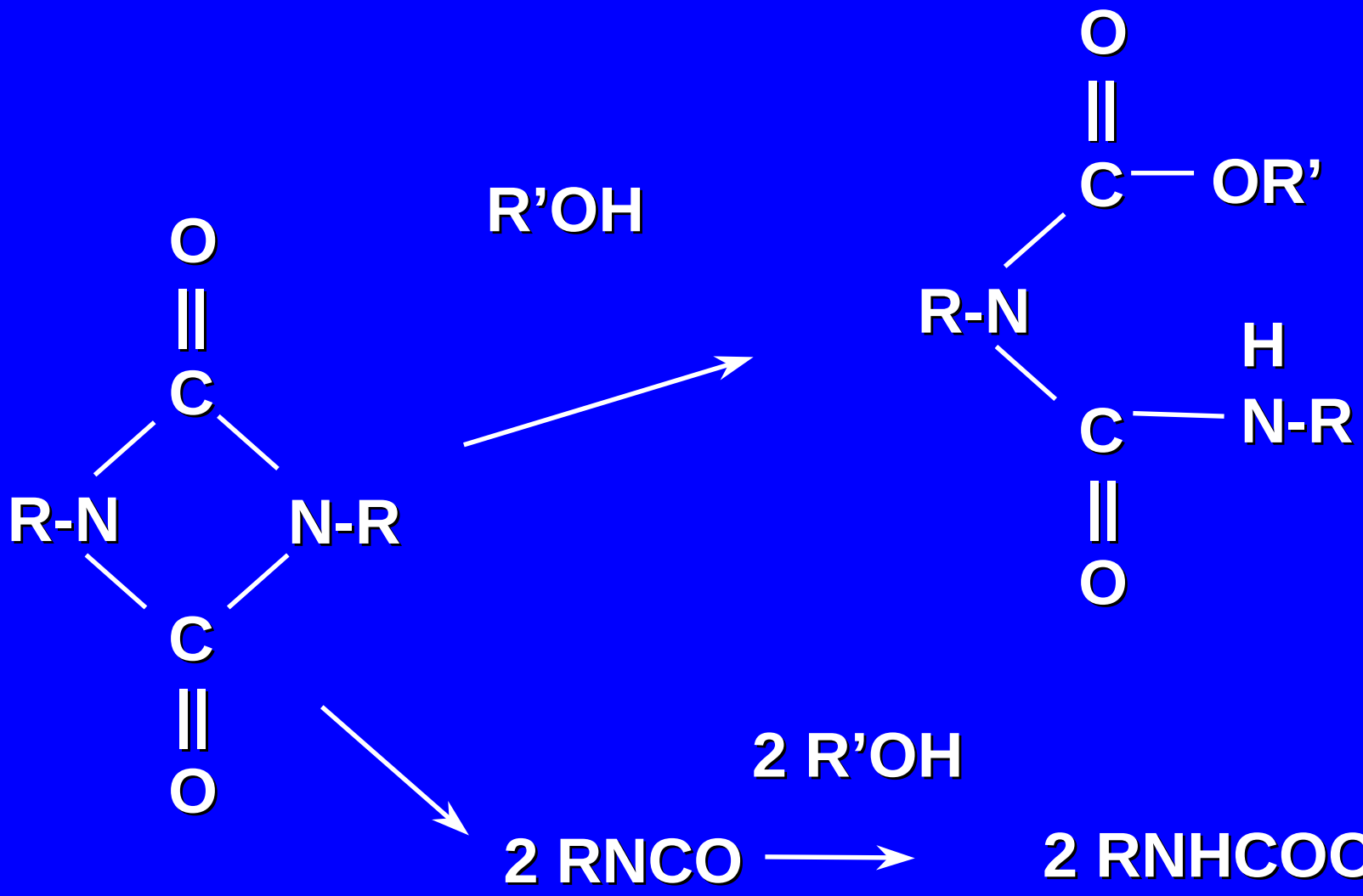
# PHENOL BLOCKED ISOCYANATE

## CATALYST SELECTION, 0.22 % Me




SL2239

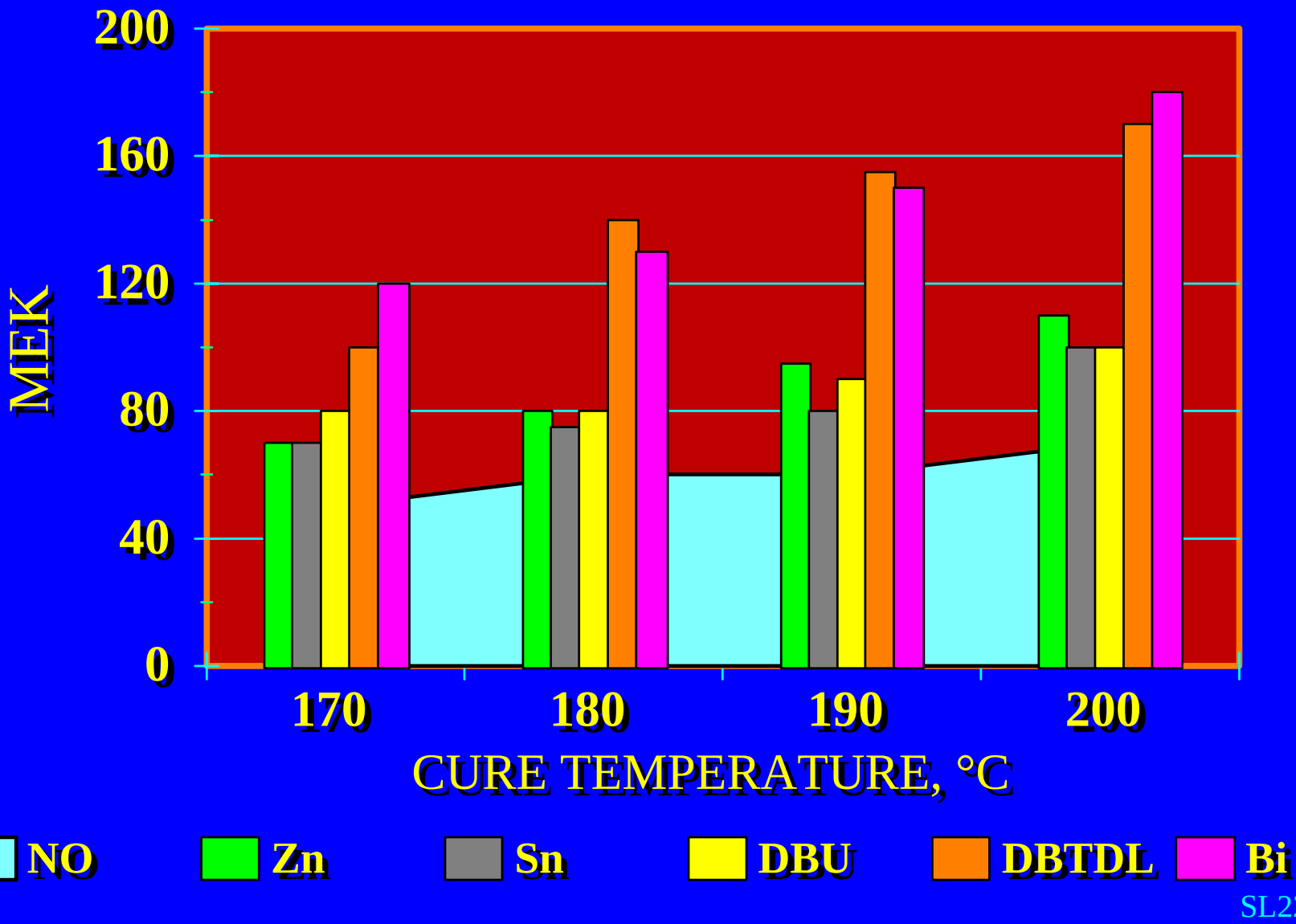
# URETDIONE BLOCKED ISOCYANATES




SL2235

# URETDIONE BLOCKED ISOCYANATE

## CATALYST SELECTION

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# ACKNOWLEDGEMENT

## TECHNICAL SERVICE DEPARTMENT

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