MMB - MethoxyMethylButanol

Specialty Solvent

for

Paint & Coatings

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METHOXYMETHYLBUTANOL

An innovative solution for the industry.

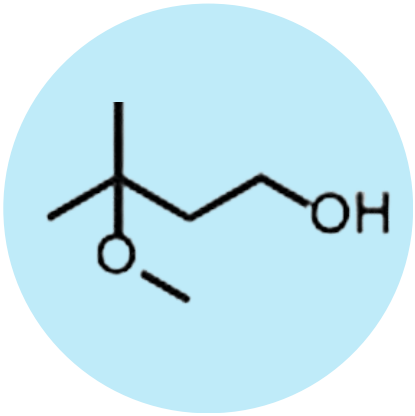
MMB is a specialty ingredient produced by Kuraray. It is a clear, colorless and completely water-soluble liquid with a mild odor. MMB is a robust, safe and environmentally friendly molecule.

Main applications

- Home care and institutional detergents
- Industrial cleaning solutions
- Printing inks and paints
- Air care
- Fragrance
- Others : Nail polish removers, pesticides, hand sanitizers...

Main benefits

- Low toxicity and biodegradable
- High flash point, low freezing point
- Stable versus autoxydation, at extreme pH (2-13)
- Mild odor, clear, colorless
- Amphiphile
- Good solvency power
- Unique evaporation rate
- Excellent hydrotrope



Registration Status: Worldwide registered

AICS (Australia) : Listed
DSL (Canada) : Listed
ENCS (Japan) : Listed 2-3079
PICCS (Philippine) : Listed
SWISS (Switzerland) : Listed G-117002
UK REACH: Listed (by UK OR)
CRC-SEPA (China) : Listed
ECL (Korea) : Listed KE-24367
NZIoC (New Zealand) : Listed
REACH (EU) : Registered
TSCA (USA) : Listed
KKDIK (Turkey): Pre-registered

Chemical properties

Chemical Name:	3-methoxy-3-methyl-1-butanol
CAS n° :	56539-66-3
Boiling point (@760mmHg, 101kPa) :	173°C
Freezing point :	<-50°C
Flash point (Tag's CC) :	71°C
Specific gravity (@20°C) :	0.927
Viscosity (@20°C) :	12.5 mPa.s
Log Pow (@25°C) :	0.18
Solubility in water :	Infinite
Hansen Solubility Parameter :	9.88
Evaporation rate (n-BuAc=100) :	7
Vapor density (Air = 1) :	4.1
Vapor pressure (@ 20°C) :	0.07 kPa = 0.5 mmHg
Surface Tension (@ 20°C) :	29.9 dyne/cm
Ignition point :	395°C

Effect on Plastics and Elastomers

Plastics	Volume % vs Initial*
Rigid PVC	8
Soft PVC	9
Polyethylene (low density)	0
Polyethylene (high density)	0
Polypropylene	0
Polystyrene	19
Polycarbonate	0
Polyacetal	0
PET	0
PBT	0
Polyphenylene Sulfide	0
6-Nylon	0
6,6-Nylon	0
Teflon ®	0
Epoxy Glass	0
Acrylic Resin	Partially Dissolved
Phenol Resin	0
ABS	63

Elastomers	Volume % vs Initial*
Fluoro Rubber Viton®	82
Chloroprene Rubber	64
Butyl Rubber	0
Nitrile Rubber	115
Silicone Rubber	6
Ethylene Propylene Rubber	7
Natural Rubber	17
Urethane Rubber	129
SBR	26

*Volume increase % of tested sample (50x20x2 mm) after soaked in MMB at 50°C for 7 days.

METHOXYMETHYLBUTANOL

A respectful solvent

For users:

Safety data:

- Acute Oral Toxicity : LD50 4.30g/kg (rats)
  : LD50 5.83g/kg (mice)
- Dermal Irritation : 0.6 Slightly irritant (MMB 100%, rabbits, 28 days)
  : 0.0 (MMB 50% (with DW),rabbits, 28 days)
- Skin sensitization : Negative
- Inhalation Toxicity : No significant change (rats/500 ppm/28 days)
- Mutagenicity : Negative (Ames test)
- Teratogenicity : Negative (Developmental NOEL 500mg/kg, rat)

Listed CTFA - INCI : Methoxymethylbutanol

NSF certification for incidental food contact

For the environnement:

Biodegradability: Readily Biodegradable

- Method: OECD Test Guideline 302C
  Biodegradation: 100 % Exposure time: 28 d
- Method: OECD Test Guideline 310
  Biodegradation: 78.9 % Exposure time: 28 d

European Ecolabel compliant

Listed Cleangredient

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MMB - 3-methoxy-3-methyl-1-butanol

Paints & Coatings

MMB (3-methoxy-3-methyl-1-butanol) is a specialty solvent produced by Kuraray. It is a clear, colorless and a completely water-soluble liquid with a mild odor. MMB is a robust, safe and environmentally friendly molecule.

Main benefits for Emulsions

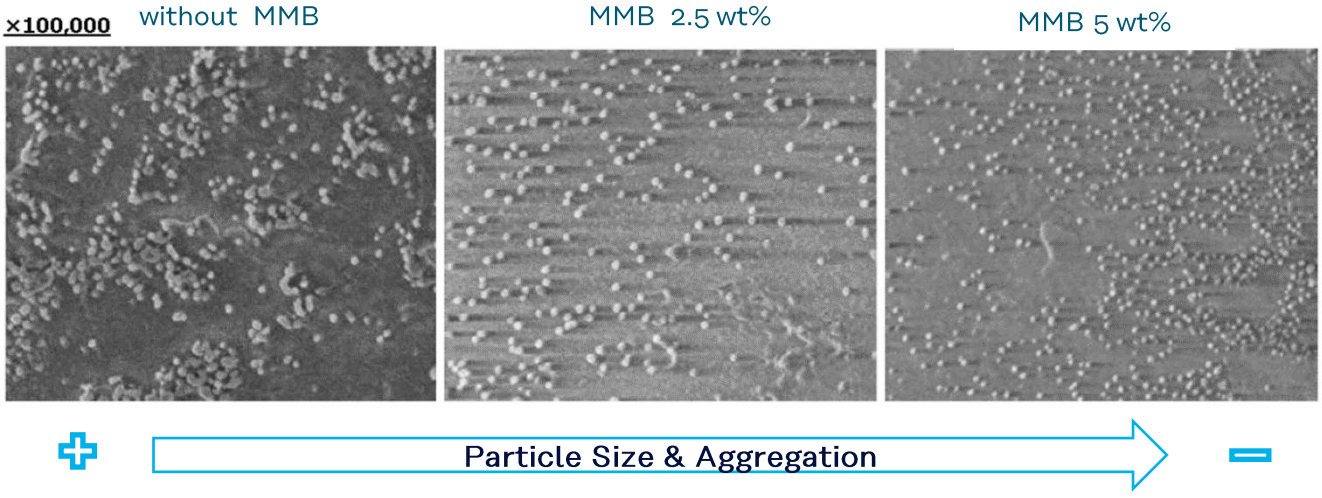
- Safe product with good toxicity and eco-toxicity data
- Excellent stability in alkali, basic and acidic mediums
- Easy to formulate with (totally soluble in water)
- Low viscosity
- Good coalescing agent
- Good alternative to hazardous solvents such as Butyl Glycol

Main characteristics

- Flash Point (Tag's CC) : 71° C
- Boiling Point : 173° C
- Freezing Point : < -50° C
- Viscosity (cP@20° C) : 7,3
- Surface Tension (dyn/cm@20° C) : 29.9
- Readily Biodegradable

Good coalescing agent – Particle size and aggregation

Acrylic emulsion
Monomer : 2-EtHex-Acrylate / Butyl-Acrylate / Acrylic Acid = 48 / 48 / 2
Solid content : 50wt%
Surfactant : 1wt% (vs monomer)



The more MMB, the particules are smaller and there is less aggregation.

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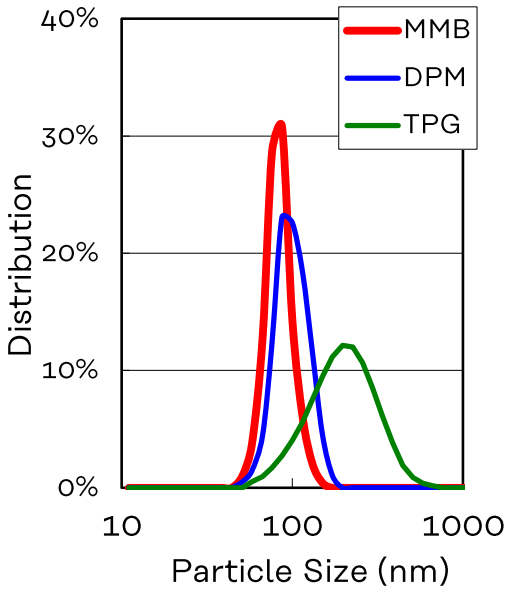
MMB - 3-methoxy-3-methyl-1-butanol

Paints & Coatings

Comparison with other solvents

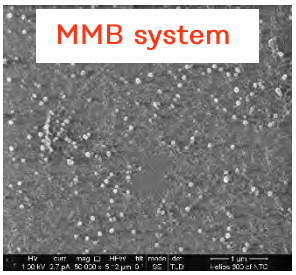
FA: Heptadeca Fluoro Dodecyl Acrylate
StA: Stearyl Acrylate
NMAA: N-Methylol Acryl Amide
DPM: Dipropylene glycol monomethyl ether
TPG: tripropylene glycol

Perfluoroalkyl acrylic emulsion
Monomer : FA / StA / NMAA = 57 / 40 / 3 (wt ratio)
Solid : 38wt%
Solvent : 33wt% (vs monomer)
Surfactant : 10wt% (vs monomer)

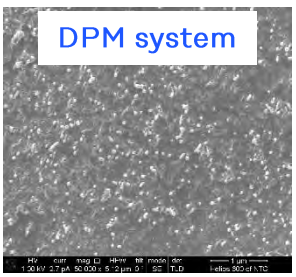


Solvent	MMB	DPM	TPG
Median Size (nm)	77	92	185

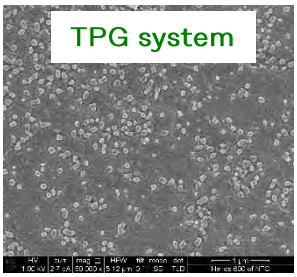
- Size and distribution of particles in the emulsion



No aggregation
High sphericity



Aggregation
Low sphericity



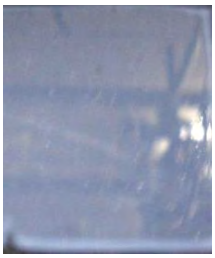
Aggregation
Very low sphericity

- Transparency of emulsions

MMB system

Transparent

DPM system



Translucent

TPG system

Translucent

MMB helps stabilize emulsions: particles will be smaller and spherical, no aggregation which will result in a transparent film after application.

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