A new brand: Special Solvent

KJCMPA®-100

KJCBPA®-100

Technical Data

KJ Chemicals Corporation
Sales Department
Business division
What is KJCMPA®-100

- A transparent solvent containing both amide group “–CONR₁R₂” and ether group “-CH₂CH₂-O-R₃”.
- A special solvent designed and manufactured by KJ Chemicals Corp..
- A completely novel solvent which has already registered in Japan, Taiwan, Korea, USA, and Europe.

The structure of KJCMPA®-100:

\[
\begin{align*}
R₁ & : \text{Alkyl group} \\
R₂ & : \text{Alkyl group} \\
R₃ & : \text{Alkyl group}
\end{align*}
\]
1. High ability to solubilize a lot of solutes with a wide range of polarity.
2. High ability to solubilize less solvable Polyamide & Polyimide, to a high extent.
3. Shows no evidence of irritation to skin.
Applications

• Are you facing a difficult and challenging situation to
  mix with a solution?
  spread over a variety of substrates?
  dissolve a variety of polymers?

• Then try to use ---

[Chemical structure image]
An innovative solvent

¶ KJCMPA®-100 can do

1. **mix** with a variety of solutions.
   - Water
   - n-Hexane

2. **dissolve** a variety of polymers.
   - Nylon
   - PU
   - PVDF
   - PI

3. **spread** over a variety of substrates.
   - Glass
   - PVC
   - PC
KJCMPA®-100 can mix with a variety of solutions

- Designed by introducing both an amide group and an ether group to provide “amphiphilic” property.
- Can mix with a lot of solutes from high polar water to low polar oil at any ratio.

Compatibility test data

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Grade</th>
<th>R3</th>
<th>Solutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Liquid paraffin</td>
</tr>
<tr>
<td>KJCMPA®-100</td>
<td>Me</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>KJCBPA®-100</td>
<td>n-Bu</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

References

- NMP: ○ × × ○ ○ ○
- Acetone: ○ × ○ ○ ○

Test conditions: Solvent / Solute = 1/1 ratio, at room temp. ○ : perfect compatible, × : non-perfect compatible
The results of Reproduction/developmental toxicity screening test of KJCMSPA-100

Effects on the Dams

- **KJCMSPA-100**
  - 500 mg → no effect
  - 125 mg → no effect

- **NMP**
  - 500 mg → suppressed body weight gains
  - 750 mg → suppressed body weight gains
  - 1,000 mg → suppressed body weight gains
  - Fatal case (observed in 1 of 12 rats)

Effects on Embryo-Fetal Development

- **KJCMSPA-100**
  - 150 mg → no effect
  - 25 mg → no effect
  - 125 mg → no effect
  - 500 mg → suppressed body weight gains
  - 750 mg → suppressed body weight gains

- **NMP**
  - 150 mg → no effect
  - 25 mg → no effect
  - 125 mg → no effect
  - 250 mg → teratogenicity (observed in 1 of 304 rats)
  - 500 mg → teratogenicity, high rate of death (observed in 11 of 311 rats)

(NMP*: Food Chem Toxicol. 2002 40:1705)

- It was classified into **Category 2** regarding toxicity to reproduction based on the results of simple screening tests which unfortunately did not show a good result.
- On the other hand, NMP is classified into **Category 1B** and is a restricted substance in Europe. Our consultant’s opinion is that a substance in Category 2 is not likely to become a SVHC.
KJCMPA-100 is considered to have no teratogenic effect in rats, and no embryo-fetal lethal effects were observed.

- Therefore, KJCMPA-100 is considered to be more safety product to compared with NMP (> teratogenicity) on reproductive toxicity.
- We have stated requesting ECHA to make review for the classification based on these results and hopefully it should be reclassified to be a substance with “non classification”.

(NMP*: Food Chem Toxicol. 2002 40:1705)
Solubility of KJCMPA®-100

• can dissolve poorly soluble substances, such as Nylon, PU and PVDF that can be also dissolved in NMP.

1) Nylon

![Nylon dissolution process](image)

- Temperature: 160°C
- Solution: NMP
- Concentration: 20wt%
- KJCMPA-100
Solubility of KJCMIPA®-100

2) Polyurethane

Standing overnight after heating

100°C

KJCMIPA-100

Standing overnight after heating

100°C

NMP
Solubility of KJCMPA®-100

3) PVDF

80°C → 10wt% → Standing → KJCMPA-100
No precipitate

70°C → 10wt% → Standing → NMP
No precipitate
Solubility of KJCMMPA®-100

4) Polyimide

Using KJCMMPA®-100 as solvent, you can synthesize high MW polyimide without precipitation.

Polyamic acid, a precursor of polyimide

Conc. 17.3wt%, Rx Temp. 30°C

KJCMMPA®-100 Mw 312*10³

DMAc precipitated

NMP Mw 299*10³

NEP Mw 299*10³
Conc. 20.7wt%  
KJCMPA®-100  
MW 243 thous.  
Precipitated  
Rx Temp 35°C

Conc. 23.8wt%  
KJCMPA®-100  
MW 343 thous  
Precipitated  
Rx Temp 40°C

Conc. 34.3wt%  
KJCMPA®-100  
MW 253 thous  
KJCBPA®-100  
MW 283 thous  
Rx Temp 40°C
Spread over a variety of substrates

Less wettable

More wettable

More polar

Less polar

Test substrates in order of water wettability
- Glass
- PVC “polyvinyl chloride”
- PC “poly carbonate”
- SPS “syndiotactic polystyrene”
- Aluminum
- Copper
- PP “polypropylene”
KJCMPA®-100 can be used in

- Inks
- Coatings
- Adhesives
- Reaction Solvents
- Low Surface tension
- High Wettability
- Low Viscosity
- High Solubility
- High Solvency
- High Permeability
- Compatibility Improver
- Cleaners
- High Fluidity
- Diluting Solvents
## Physical & Chemical Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>KJCMPA®-100</th>
<th>KJCBPA®-100</th>
<th>NMP (Literature)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point (°C)</td>
<td>216</td>
<td>252</td>
<td>204</td>
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<tr>
<td>Melting Point (°C)</td>
<td>-49</td>
<td>-17</td>
<td>-24</td>
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<tr>
<td>Density (g/cm³, 20°C)</td>
<td>0.99</td>
<td>0.94</td>
<td>1.03</td>
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<tr>
<td>Viscosity (mPa·s, 20°C)</td>
<td>2.3</td>
<td>3.6</td>
<td>1.8</td>
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<tr>
<td>Surface Tension (mN/m, 23°C)</td>
<td>34.2</td>
<td>29.3</td>
<td>38.6</td>
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<tr>
<td>Vapor Pressure (kPa, 20°C)</td>
<td>0.016</td>
<td>0.002</td>
<td>0.04</td>
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<tr>
<td>Solubility Parameter</td>
<td>10.5</td>
<td>9.8</td>
<td>11.5</td>
</tr>
<tr>
<td>Flash Point (PM method, °C)</td>
<td>93</td>
<td>98</td>
<td>91</td>
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<tr>
<td>IMDG Code</td>
<td>Combustible Liquid</td>
<td>Combustible Liquid</td>
<td>Combustible Liquid</td>
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<tr>
<td>Acute Effects: Oral LD50 (mg/kg)</td>
<td>&gt; 2,500</td>
<td>300 - 2,000</td>
<td>&gt; 2,500</td>
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<td>Bacterial Mutagenicity (Ames Test)</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
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<tr>
<td>Primary Irritation Index (P.I.I.)</td>
<td>0</td>
<td>No information</td>
<td>0.5</td>
</tr>
</tbody>
</table>

The data set forth herein shows sample figures measured under certain specific conditions.
This product will be supplied after we acknowledge customer’s application and countries where customer’s products are used.

1. The data set forth herein shows sample figures measured under certain specific conditions.
2. Please note the information set forth herein may be altered from time to time according to improvement of products without prior notice.
3. The physical properties of other solvents set forth herein are quoted from catalogs and literatures.
4. In case of product being used for purpose and usage introduced set forth herein, please pay attention to industrial proprietary rights of third party which may relate to such use.
5. In case of product being used for medical device, please consult with the manufacturer before such use.

Order Placement and Product Information

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