Comparison of EkaSol 1™ to MEK

Purpose

This document compares the environmental considerations, safety and effectiveness of EkaSol 1 vs. Methyl Ethyl Ketone (MEK).

Factors to consider

	EkaSol 1	MEK
Environmental		
VOC Content: U.S. EPA (outside SCAQMD)	**0**	100%
VOC Content: SCAQMD	**2.66 g/L‡**	100%
Maximum Incremental Reactivity	**0.47**	1.48
Safety		
Flashpoint	**5 °C**	-9 °C
Oral Toxicity (LD_{50}, rat)	**>5000 mg/kg**	2737 mg/kg
Effectiveness		
Evaporation Rate (*n*-Butyl Acetate = 1)	**3.62**	3.86
Hansen Solubility Parameters $(MPa)^{1/2}$	**19.1**	19.1
(δ_D) Dispersion	**15.7**	16.0
(δ_P) Polarity	**6.4**	9.0
(δ_H) Hydrogen Bonding	**8.5**	5.1
Hildebrand Solubility Parameter $(MPa)^{1/2}$	**19.9**	19.3

‡ASTM Test Method 313-91. EkaSol 1 is a blend of VOC-exempt solvents and is thus considered Zero VOC by the EPA.

Environmental considerations

The most important advantage of EkaSol 1 over MEK is its environmental performance. EkaSol 1 contributes zero VOC when calculated according to the U.S. EPA outside of the South Coast Air Quality Management District (SCAQMD). In SCAQMD, EkaSol 1 is comprised of 77% VOC-exempt material.

By contrast, MEK is an 100% VOC emitter everywhere in the U.S. and Canada.

EkaSol 1 has a lower Maximum Incremental Reactivity (MIR) value than MEK: 0.47 (EkaSol 1) vs. 1.48 (MEK). This makes EkaSol 1 particularly useful in reformulating aerosols to meet new MIR regulations while maintaining performance properties.

Safety

EkaSol 1 has a higher flash point than MEK: 5.0 °C (EkaSol 1) vs. -9 °C (MEK).

EkaSol 1 is much less flammable and thus safer than MEK.

LD_{50} assesses toxicity derived from acute exposure. The acute oral toxicity of MEK is much lower than that of EkaSol 1 which indicates a more toxic product:

- MEK has an oral LD_{50} of 2737 mg/kg body weight (rat)
- EkaSol 1 has an oral LD_{50} of approximately 5000 mg/kg body weight (rat)

Studies have found MEK to be carcinogenic and a central nervous system depressant. There is no indication of MA causing other toxic effects other than those derived from acute exposure.

Performance

EkaSol 1 was designed to closely mimic MEK in evaporation rate and solubility profile. Its performance is comparable to MEK across all solvency and other performance parameters.

tel: +1 877 658 3681
info@tbfenvironmental.com
www.tbfenvironmental.com