

Physical property Comparison of CPME versus MeTHF and THF

| | | CPME | MeTHF | THF |
|------------------|--|-------------|-------------|-------------|
| CAS number | | 5614-37-9 | 96-47-9 | 109-99-9 |
| Molecular weight | | 100.16 | 86.13 | 72.11 |
| (1) | Solubility of solvent in water (23°C) [g/100g] | 1.1 | 14 | Infinite |
| | Solubility of water in solvent (23°C) [g/100g] | 0.3 | 4.4 | Infinite |
| (2) | Flash point [°C] | -1 | -11 | -14.5 |
| | Peroxide formation | slower | faster | faster |
| | Explosion range [vol%] (Lower / Upper limit) | 1.1 / 9.9 | 1.5 / 8.9 | 1.84 / 11.8 |
| (3) | Stability to acids | more stable | less stable | unstable |
| (4) | Boiling point [°C] | 106 | 80 | 66 |
| | Melting point [°C] | <-140 | -136 | -108.5 |
| | Latent heat of vaporization (bp) [Kcal/kg] | 69.2 | 89.7 | 98.0 |
| (5) | Azeotropic temperature with water [°C] | 83 | 71 | 64 |
| | Azeotropic composition (solvent / water) [wt%] | 83.7 / 16.3 | 89.4 / 10.6 | 93.3 / 6.7 |
| (6) | Solubility parameter [cal/ml] | 8.4 | 8.52 | 9.15 |
| | Dielectric constant (25°C) | 4.76 | 7.0 | 7.4 |
| | Dipole moment [D] | 1.27 | - | 1.7 |

(1) CPME has extremely low miscibility with water.

- You can easily make clear phase separation.
- You can use CPME as an extraction solvent as well as a reaction solvent.
- You can reduce variable and fixed cost by telescoping and one-pot reaction with CPME.
- You can recover greater than 95% of CPME.

(2) CPME has a higher flash point and lower peroxide formation.

- You can use CPME in filtration.
- The peroxide formation of CPME is much slower than that of MeTHF.

(3) CPME has more stability to acids.

- You can use CPME in acidic conditions such as 4M-HCl in CPME solution.

(4) CPME has a higher boiling point and lower vaporization energy.

- You can accelerate reaction and save reaction time.
- You can use CPME as a crystallization solvent as well as for reaction and extraction.

(5) CPME has higher efficiency for azeotropic dehydration.

- You can easily dry CPME by azeotropic distillation.

(6) CPME has medium polarity.

- You can use CPME as a crystallization solvent as well as for reaction and extraction.



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