GREENER ALTERNATIVES
FOR DICHLOROMETHANE (CH_2Cl_2)

The U.S. Environmental Protection Agency (EPA) has restricted the use of dichloromethane (also known as methylene chloride or DCM) due to concerns over toxicity, volatility, and carcinogenicity. This guide provides possible alternatives.

Remember: no solvent can replace another in all contexts. Match properties based on application.

EXTRACTION

Goal: efficient phase separation and selective solubility
Key properties: density, polarity, immiscible with water
Examples: ethyl acetate, cyclopentyl methyl ether (CPME), tert-amyl methyl ether (TAME)

CHROMATOGRAPHY

Goal: appropriate solubility and volatility for purification
Key properties: polarity and compatible with stationary phase
Examples: ethyl acetate/heptane or methanol/ethyl acetate mixtures, 2-methyltetrahydrofuran (MeTHF)

SYNTHESIS

Goal: dissolve and mix materials used in a reaction
Key properties: low reactivity and easy separation
Examples: dimethyl carbonate (DMC), 2-methyltetrahydrofuran (MeTHF), ethyl acetate

CLEANING

Goal: dissolve residues while minimizing volatile organic compound hazards
Key properties: solvency (Kauri-butanol value) and boiling point
Examples: isopropanol (IPA), acetone, ethyl lactate

PHYSICOCHEMICAL PROPERTIES

Solvent	Boiling Point (°C)	Density (g/mL)	Log P_{ow}[1]	Safety Ranking[2]
Dichloromethane	40	1.33	1.25	⚠ Hazardous
2-Methyltetrahydrofuran	80	0.86	1.25	Problematic
Acetone	56	0.79	-0.23	Recommended
Cyclopentyl methyl ether	106	0.86	1.59	Problematic
Dimethyl carbonate	90	1.07	0.35	Recommended
Ethyl acetate	77	0.90	0.73	Recommended
Ethyl lactate	154	1.03	-0.18	Problematic
Isopropanol	82.3	0.79	0.05	Recommended
tert-Amyl methyl ether	86	0.77	1.55	Recommended

1. Logarithm of the octanol-water partition coefficient.
2. ACS Green Chemistry Institute® Pharmaceutical Roundtable. Solvent Selection Guide: Version 2.0. March 21, 2011.

Disclaimer: The information presented here is intended for educational guidance and does not guarantee suitability for a particular process or safety. Solvent selection should be based on application-specific evaluation. Consult institutional safety resources and material safety data sheets (MSDS) before use.

Learn more about selecting greener solvents:

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