



Phase-Transfer Catalysts

Aliquat®



The application of phase-transfer catalysis in chemical synthesis delivers increased performance and reduced costs for thousands of commercial reactions in over 35 reaction categories.

Advantages of Aliquat products:

- Increase yield
- Improve selectivity
- Reduce reaction time and temperature
- Reduce excess reactants and waste
- Replace expensive hazardous strong bases with NaOH
- Replace undesired solvents such as DMSO, NMP, DMF
- Enhance process safety

Products overview:

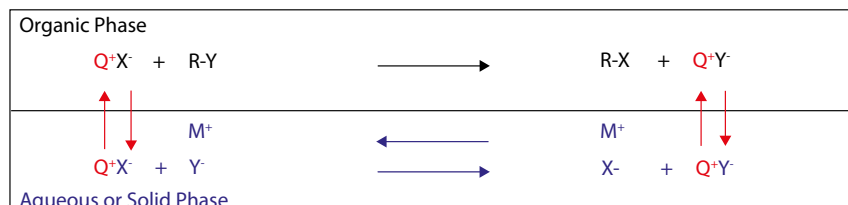
Product name	Chemical description
Aliquat 336	Tricaprylylmethylammonium chloride



Phase-transfer catalysis in a nutshell

For a desired reaction $R-Y \rightarrow R-X$, the reagent MX might be dissolved in the aqueous phase whereas the substrate is in the organic phase. This usually results in poor conversion.

Phase-transfer catalysis is based on the ability of a catalyst (Q^+), typically a quaternary ammonium cation, to transfer and actually solubilize an otherwise hydrophilic anion in an organic phase. The anion (X^-) is typically a nucleophile, a base, an oxidizing or a reducing agent. Once in the organic phase, the anion can react with enhanced reactivity with an organic soluble substrate ($R-Y$).





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Reaction Types in which Phase-Transfer Catalysts excels

Strong Base Reactions

- Alkylations
 - Etherification*
 - C - Alkylation*
 - N - Alkylation*
 - S - Alkylation*
- Dehydrohalogenation
- Condensations
 - Aldol*
 - Michael*
 - Wittig*
 - Darzens*
- Chiral Alkylation & Addition
- Carbenes
- Deuteration

Nucleophilic Aliphatic Substitution

- Esterification
- Transesterification
- CN⁻
- F⁻
- Br⁻
- I⁻
- N₃⁻
- S₂⁻
- SCN⁻
- OCN⁻
- SO₃²⁻
- NO₂⁻, NO₃⁻

Oxidation

- Epoxidation
- H₂O₂
- ClO₂⁻, BrO⁻
- Oxygen / Air
- MnO₄⁻, Cr₂O₇²⁻
- S₂O₈²⁻
- Oxone
- Superoxide
- Electrochemistry

Polymerization

- Condensation
- Radical

Strong Acid Reactions

- HCl, HBr Additions
- Chloromethylation
- Ether cleavage

Transition Metal Co-Catalysis

- Reduction
- Carbonylation
- Coupling reactions

Reduction

- BH₄⁻
- Hydrogenation
- S₂O₄²⁻

Aliquat® is a brand name of the company BASF.

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