

SPECIAL FEATURE SECTION: SOLVENTS AND SOLVENT EFFECTS

Editorial

Solvent selection is arguably one of the most important but least systematic parts of the process development activity. The solvent has to satisfy so many criteria. It should be cheap, environmentally benign; it should be stable over the required range of reaction conditions. It should have the right physical properties to allow easy isolation and drying. In an ideal world we want our solvent to be able to dissolve our reactants and reagents at high concentrations, but at the same time we want our product to be less soluble if possible so that we can crystallise our product directly from the reaction. Given all these and many other, often conflicting, demands, it is not too surprising that we normally fall short of our ideals and rely on mixed-solvent processes or introduce one or two solvent swaps. Both of these give rise to additional costs either from expensive solvent separations or incineration, or due to increased cycle time and perhaps poorer volume efficiency. Until recently, this part of our work has been the domain of empiricism, even though much of the data that would allow a more systematic approach have been known and understood by engineers and physical chemists for many years. This special feature section covers a range of topics including current and future environmental drivers, potential new solvents, and theoretical approaches for solvent selection. Over the last 10 years the costs and environmental issues facing our industry have placed significant focus on solvent selection. These pressures I am sure will increase in the years ahead, but so will the pace of process and development. A more scientific approach to solvent selection will be a major component to future sustainability within our industries.

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