EVALUATION OF SUB-2µM SILICA AND HYBRID PARTICLES FOR SFC APPLICATIONS

Hudalla, C., Collier, S., Fairchild, J., Fountain, K.J., Hill, J., Iraneta, P., and Jablonski, J. - Milford, MA/USA

Christopher J. Hudalla, Waters Corporation, Chemistry Applied Technology, Milford, MA, USA

Supercritical Fluid Chromatography (SFC) has recently gained interest for achiral separations, in part due to improvements in instrumentation and software, providing more consistent and robust operating conditions, as well as for increased savings due to decreases in solvent consumption and analysis time. The recent release of the first commercially-available Ultra-Performance SFC (UPSFC) instrument provides the opportunity to make use of smaller particles sizes, smaller columns, and more robust chemistries for SFC applications. These opportunities take advantage of low system dispersion of the UPSFC system which has not been previously available. The greatest realization of these benefits can be observed with SFC particles that are less than 2µm in particle size.

Here we present our research in the development of next generation SFC stationary phases, highlighting the advantages offered by the sub-2µm particle size. The high strength silica and hybrid base particles provide unique substrates for ligand bonding that broaden selectivity choices for a diverse set of analytes. In addition, the availability of these chemistries in the larger 5µm particle size enables scaling to larger column dimensions, potentially all the way up to dimensions suitable for preparative separations. We will focus on the differences in selectivity between the different chemistries, and the improvements in peak shape and analysis time realized by the smaller particle size chemistries.