What is the difference between a 4um and a 5um particle in a C18 column - FAQ

Using a column with a 4um particle designation is not much different from a column that has a 5um particle in terms of performance and is nominal.

The "particle size" used to describe a C18 HPLC columns refers to the approximate size of silica beads that are used to manufacture an HPLC stationary phase. This is true for most silica based HPLC columns regardless of the bonded phase.

Most stationary phases use a distribution of silica particle sizes since this is the most economical way to manufacture silica as well as it is better for column packing compared a more mono-disbursed particle size of silica. In most modern HPLC stationary phases particles sizes that are used, have a range of sizes from small to large in the column. These sizes are measured before modification and the distribution of size is recorded and plotted; particle size on the horizontal axis versus quantity on the y axis. This data normally results in a Gaussian curve with the majority of the particles in the mid-range. The particles are then named by the most commonly used name which may not reflect the actual particle size median.

Most silica is nominally designated as 1.8um, 2.2um, 3um, 5um, 10um and larger but each of these sizes contain a range of particle sizes.

For a C18 column to qualify as an L1 in the USP Classification system, it must meet the following criteria and be approved by the USP.

Octadecyl silane chemically bonded to porous or non-porous silica or ceramic micro-particles or superficially porous particles, 1.5 to 10 µm in diameter, or a monolithic rod.

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