Cogent TYPE-C™ Columns used in LC-MS

LC-MS is frequently the method of choice for the analysis of both small molecules and larger biomolecules due to the sensitivity, selectivity and robustness of the technique. Increasingly lower concentrations of analytes are required to be measured from complex sample mixtures or matrices. LC-MS shows improved detection limits and may require reduced sample preparation compared to UV or other HPLC detection systems. In many cases the use of LC-MS eliminates or reduces the need for time consuming derivatization of compounds lacking UV chromophores. LC-MS is widely used in pharmaceutical, clinical, forensic, environmental, food & beverage and many other application areas.

Any build-up of matrix (e.g. plasma) on a column is less of a concern with Cogent columns due to the low level of surface silanols and the lack of water shell. Short washing protocols can be incorporated into a method to remove contaminants and keep the column clean and in service.

Although acetone is not useful for LC-UV due to its high UV cut-off, it may be used instead of acetonitrile in LC-MS analyses with TYPE-C silica-hydride HPLC columns. It is more environmentally friendly and easier to recover and reuse. Acetone and acetonitrile can be used interchangeably for the LC-MS analysis of amino acids, although similar results are not obtained for all compound types.

Cogent TYPE-C silica phases are particularly useful for the LC-MS analysis of polar and non-polar compounds. They have several features making them ideal for LC-MS analyses.

- **Higher percentage composition of organic solvent (e.g. acetonitrile).** The high percentage of organic solvent makes the mobile phase more volatile and generally increases ionization sensitivity.
- **Use LC-MS friendly buffers.** The aqueous component of the mobile phase used with TYPE-C silica-hydride phases usually contains from 0.1 to 1.0% formic and or 1.0 to 2.0% acetic acid, which is compatible with LC-MS. For negative ionization mode it is recommended to use 10 to 16mM ammonium formate or ammonium acetate. Higher concentration of this buffer will result in contamination of the source. When these buffers are used as an additive in solvent B (organic solvent), add 1 to 3% of DI water to assure miscibility.
- **Fast equilibration.** Due to no hydration shell. This leads to faster runs and less solvent consumed, resulting in savings in cost and time. For gradient runs, the cycle time is reduced.
- **Low column bleed.** The strong Silicon-Carbon bonds and Si-H surface result in very low levels of bleed due to ligand cleavage. Additionally, the lack of end-capping means that there is no bleed from any end-capping agent.
- **Increased column lifetime.** The stable robust Silicon-Carbon bonds of the TYPE-C silica-hydride bonded phases enable columns to have much longer lifetimes.

Figure 36.