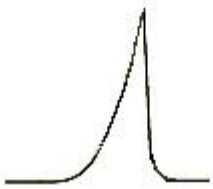
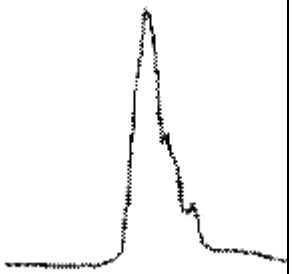
PROBLEMS WITH PEAK SHAPE

Poor peak shape can cause a loss of resolution between adjoining peaks, it can lead to poor injection to injection reproducibility, or it may cause an injection to fail method acceptance criteria. Poor peak shape includes issues such as tailing, fronting, split peaks, and shouldered peaks.

The causes of poor peak shape are varied. They include everything from poorly developed methods, to contaminated columns or in other parts of the system, to extra system volume or poor system connections.

The following chart covers some of these common problems and possible remedies.

Problem	Indication	Cause	Solution
	One or a few peaks tailing	Unexpected analyze interaction with solid support or stationary phase	Use base deactivated, or hybrid silica materials. Old style silica have active sites on the surface that can have unintended interaction with sample analyze
			Add a mobile phase modifier to the system such as TEA
	All peaks tailing	Poor Connections in system	Ensure that all tubing ends are cleanly and squarely cut. Make sure that all nuts and ferrules are of the correct shape and tubing depth is correct for all fittings. Different manufactures have different tolerances, and they are not all interchangeable. Use PEEK or universal spring loaded connecting tubing.
		Void in Column	Replace Column
		Dirty guard Column	Replace Guard
		Dirty column frit	Replace frit

Peak Fronting 	Initial Peaks fronting	Too strong a sample solvent	Samples should be dissolved in mobile phase or solvent weaker than mobile phase
	All peaks fronting	Column overload	Reduce injection volume
			Reduce sample concentrations.
			Use a column with larger i.d.
Split Peaks 		Void or channel in column	Back flush or replace column
		Dirty column frit	Replace frit
		Dirty Column	Back flush or replace column
		Sample solvent not suitable for use with mobile phase	Ensure that sample and mobile phase solvents are compatible make any necessary adjustments
Peak Shoulders 	Shoulder on 1 or 2 peaks	Mobile phase is at 1 pH near the pKa of the analyze	Adjust pH of mobile phase to be at least 2 pH units away from the pKa of the sample analyzes Adjust mobile phase to separate the 2 peaks
	Shoulder on all peaks	Dirty Inlet frit	Replace frit
		Dirty Guard Column	Replace Guard
		Dirty Column	Back flush or replace