What is the definition of passivating and purging in HPLC – FAQ

Passivation is a chemical treatment of stainless steel and purging is a cleaning process.

Passivation is a metal finishing process to prevent corrosion and resist rust. In stainless steel (SS) the passivation process uses nitric acid or citric acid to remove free iron from the surface. This chemical treatment process leads to a protective oxide layer that is less likely to chemically react and cause corrosion.

For LC applications, to passivate a system, means means to apply a corrosion-preventive protective layer to the exposed SS of an LC System. *(See Note below.)*

Most Mobile Phases do not cause significant corrosion of 316 stainless steel but strong non oxidizing acids are an exception. hydrochloric acid strips the protective layer from stainless steel, as will dilute sulfuric acid but at a slower rate. If non-oxidizing acids are necessary to acidify mobile phases, Ortho-phosphoric acid or an organic acid, such as acetic acid are good choices.

Purging an HPLC system is a process to flush all the HPLC tubing, removing any remaining solvent from a previous analysis and replace any residual solvents in HPLC tubing with the new mobile phase. This technique is completed with the HPLC column removed from the system, as to not introduce any unwanted contamination from previously used solvents.

Note: *If Passivation is desired on an HPLC system, ensure all HPLC column and / or guard columns are removed as silica is not compatible with concentrated acids. Please ensure system is then thoroughly purged of any remaining acid, including all solvent lines, sample loop, injector and sample needle.*

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