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Brief 69-10788

NASA TECH BRIEF

Gas Chromatograph Injection Port Protective Device

The problem:

To prevent samples containing foreign materials from poisoning gas chromatograph columns, and to allow chromatographic analysis to be performed on such samples.

The solution:

The column is protected by inserting a pre-filter into the chromatograph injection port, to trap and hold undesirable species. Packing of the insert is similar to that of a wet chromatographic column in which the liquid phase becomes a variable reactant. This permits selective retention of the undesirables. For example, acids in a sample may be removed by using an alkaline liquid.

How it's done:

In attempting to use gas chromatography to analyze mixtures of hydrazine, monomethyl hydrazine, hydrazine nitrate, and water, it was found that the chromatographic column was rapidly poisoned by the deposition of hydrazine nitrates and the buildup of acidic salts.

The first problem was solved by reacting a small portion of the sample with sodium methoxide to liberate hydrazines from any free radicals present.

The second problem was solved by installing an on-column inlet modified to hold an exchangeable insert, which was packed with Polyethyleneimine (PEI) on a standard filler material. PEI is known to be an efficient trap for acidic and highly polar material.

These techniques have increased the lifetime of the chromatographic column to three months of continuous service.

Note:

Requests for further information may be directed to:

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Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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Category 03