is the only reagent which will permit the direct identification of benzene or toluene sulfonic acids. The basic technique is to precipitate the salts and take melting points. Many common multifunctional acids as well as sulfonic acids may be identified this way.

Dr. Affsprung also described uses of some other new reagents. Di-n-octyl sulfoxide, soluble in nonpolar solvents, can be used to extract acids into carbon tetrachloride and cyclohexane. It also has been used, for example, to determine gold in the presence of large amounts of iron and small amounts of platinium.

o-Aminothiophenol forms a reversible organic electrode sensitive to hydrogen ion. The reagent is useful as an indicating electrode for acid-base titrations. In addition, the thiol will precipitate and complex various metal ions, making it useful for potentiometric titrations. Besides its volumetric uses, the reagent can be used gravimetrically as a precipitant.

Chromatography. The main advantage of programmed temperature gas chromatography (PTGC) is speed, said Dr. Stephen Dal Nogare of E. I. du Pont de Nemours. The time reduction achieved by PTGC may be seen by comparing the linear correlation of carbon number and liquid phase polarity with corresponding logarithmic relations for isothermal conditions.

The best mode of operation based on maximum efficiency and resolution involves slow heating rates in the range of 5° to 10° C. per minute with conventional liquid phase column loadings of about 20%, Dr. Dal Nogare said. Decreasing the starting temperature always improves resolution. Subambient temperature programming promises to extend the usefulness of PTGC.

Limiting efficiencies can be derived and used to define the critical aspects of lean and rich columns in the performance of isothermal columns. A lean column (liquid phase about 1%) is selected for speed and a rich column, for resolution.

Dr. Dal Nogare showed how a resolution equation containing the column characteristic (β, the ratio of gas to liquid volume) serves to relate such extremes in columns as capillary and packed. A performance criterion states that $\beta d_p = 0.5$, where d_p is the particle diameter of the packing. This equation permits an estimate of the optimum fraction of liquid phases for any particle diameter for a typical diatomaceous support. The criterion requires higher liquid phase loadings for large particles (small β) and suggests