Waters
Lab Highlights
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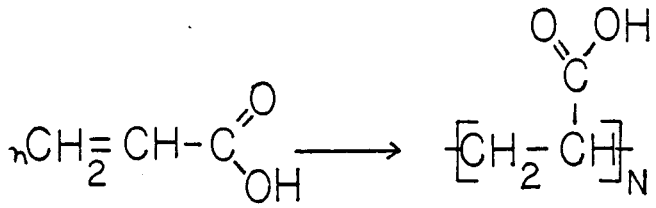
# POLYACRYLIC ACIDS

## CHEMISTRY

Polyacrylic acids (PAA's) are polymerized by direct free radical polymerization as shown:



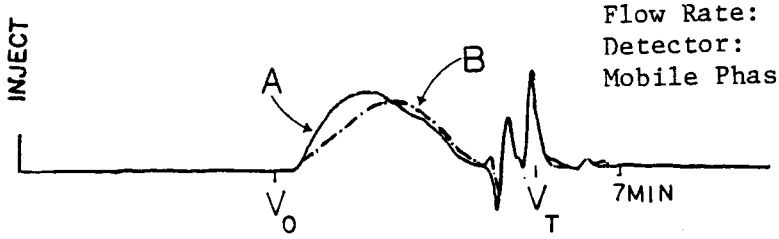
Various components such as benzoyl peroxide (initiator), sodium thiosulfate (activator) and mercaptosuccinic acid (transfer agent) are also included to aid the polymerization process. The end product of this polymerization is a hard, brittle and transparent material. PAA's are utilized as thickening agents for polymer lattices (textile finishes and paints), suspending agents for inorganic pigments, chemical agents in water purification processes, and as ion exchange resins upon crosslinking.

## CHROMATOGRAPHY

Overlay comparison of two PAA samples from different manufacturers is shown in Figure #1. It is evident from these chromatograms that Sample A is higher in molecular weight than Sample B. This information is important since it would allow the chemist to alter his formulation to compensate for differences in molecular weight.

FIGURE 1

PAA ANALYSIS




| | |
|---|---|
| Columns: | (2) µBONDAGEL™ E-125Å |
| Sample: | 0.1% (w/v) in mobile phase |
| Injection Volume: | 40 µl |
| Flow Rate: | 1 ml/min |
| Detector: | RI, 4X |
| Mobile Phase: | $H_2O$ with 13.6 g/l of $KH_2PO_4$ and 13.6 g/l of NaOAc, pH of 7.4 with 1N NaOH |

The recommended mobile phase has been selected so as to eliminate adsorption which may occur on silica-based columns such as the µBONDAGEL™ column series. When adsorption occurs, chromatograms are not reproducible from injection to injection. If adsorption is still evident with the mobile phase listed above, a small amount of PAA sample (0.025%) in the mobile phase can be used to eliminate this effect.

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