Of the remaining samples, 41 percent showed more enzymic activity; whereas 9 percent of the samples showed less. For the higher activities, shorter reaction times during analyses were used so that not more than 30 percent demethylation (*17*) of the pectin substrate occurred.

Pectic substances were divided into three groups on the basis of their solubility at room temperature in water (H_2O), in ammonium oxalate ($(NH_4)_2C_2O_4$), and in sodium hydroxide (NaOH). Pectins are expressed as anhydrogalacturonic acid (AGA) in g. per 100 g. of concentrate and as percentage of total pectin soluble in each of the three extractive solvents. The water extraction removed the water-soluble pectic substances of sufficiently high methoxyl content to be termed pectins (*12*). In citrus juices these high-methoxyl pectins give the juice its body or consistency and serve as colloidal stabilizers for the insoluble suspended particles.

Ammonium oxalate-soluble pectic substances are the insoluble salts of pectic acids and the low-methoxyl pectinic acids, resulting from the combination of these acids with polyvalent cations, such as calcium and magnesium. These water-insoluble salts are called pectates and pectinates and in citrus juices are formed as end products of chemical and enzymic deesterification of pectin. The oxalate has a sequestering effect on the calcium and magnesium ions, thus solubilizing the low-methoxyl pectinates and pectates. The presence of low-methoxyl pectins causes the two defects, gelation and clarification, in frozen concentrated citrus juices. When present in low concentrations the low-methoxyl pectins form a flocculent precipitate with polyvalent metallic ions which occludes the insoluble solids and results in clarification of the reconstituted juice upon complete settling of the pectic material. At higher concentrations the low-methyl-ester pectins form a gel structure in combination with polyvalent metallic ions. This gel formation in cans of frozen concentrated citrus juice is the defect termed "gelation" by the citrus processor.

Sodium hydroxide-soluble pectic substance represents the protopectin fraction, which is the precursor of pectin. Protopectin is also known as the water-insoluble parent pectic substance (*12*) which yields pectin upon acid hydrolysis in citrus juices. During extended storage, hydrolysis of protopectin might increase the water-soluble pectin content of citrus juices. When total pectin only is desired during analysis, sodium hydrox-