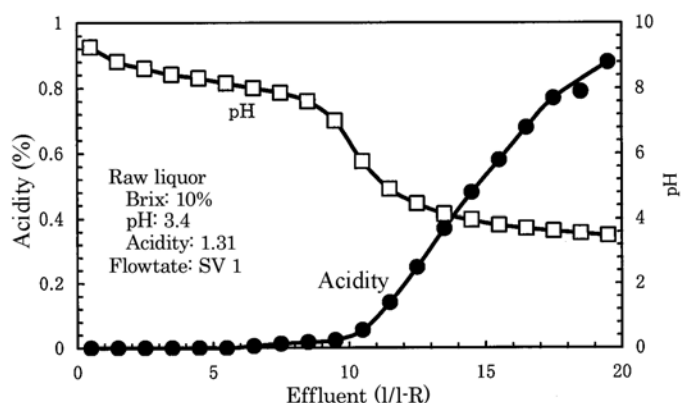


### Improvement of Tastes and Flavors of Citrus

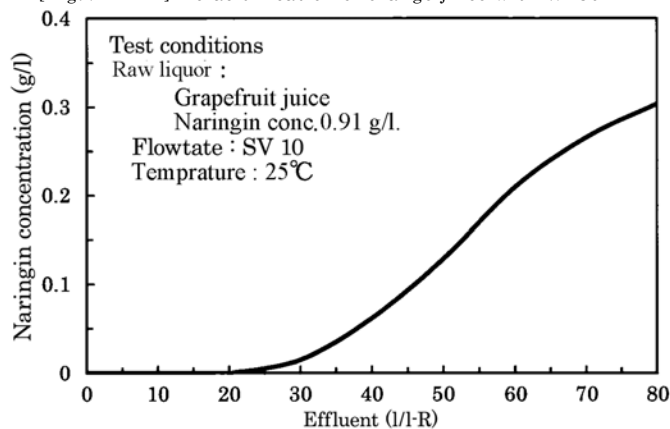
IERs and synthetic adsorbents are utilized to improve the tastes and flavors both of fresh fruits juice and concentrated one. The tastes have large effect on human preferences by the total sugar-acid ratio, and they differ much depending on the kinds of fruits, e.g. summer orange, sweet summer orange, citrus hassaku, ponkan mandarin, orange and grapefruit, growing districts and harvested seasons.

Acids are removed to adjust the total sugar-acid ratio. Citric acid is a major acid in citric fruit juice, and an excess of it is actually eliminated with WBAERs, e.g. WA10 and WA30, to improve the tastes of juice. Vitamin C, ascorbic acid, one of the useful ingredients is replaced by citric acid and is eluted out conveniently after raw juice is fed to reach the break through point, because it has lower selectivity with IERs than other acids.

As for fruit juice containing "pulp", a fibrous material to be utilized as dietary fiber, it is necessary to devise proper methods in the preparation; i.e. a) pulp should be removed by centrifuge in advance of IER treatment (downflow) and then is returned into the treated juice, b) upflow fluidized bed system or batch operation system is applied to avoid blockade in resin layers.



[Fig. VIII-4-1] De-acidification of orange juice with WA30<sup>(75)</sup>



[Fig. VIII-4-2] Removal of bitterness from grapefruit juice with SP70

Citrus fruits juice, furthermore, includes bitter ingredients, e.g. naringin and limonin, that spoil flavors. These bitter ingredients are practically removed with synthetic adsorbents, e.g. HP20 and SP70. The synthetic adsorbents that adsorb bitter materials can be regenerated with NaOH solutions, and they are sometimes treated with HCl solutions afterward to maintain the pH of fruit juice and to inhibit different odor and taste. To protect from pulp contamination is also done as in the removal of acids. Figures VIII-4-1 and 4-2 illustrate the de-acidification of orange juice with WA30 and the removal of bitterness from grapefruit juice with Sepabeads SP70 respectively.