

ABSTRACT

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Sugar Processing Research Institute (SPRI) has studied the nature of beet and cane colorants for many years. High molecular weight compounds, which include colorant and polysaccharides, are among the more important constituents contributing to color differences between beet and cane, and in the transfer of color from syrup to crystal. The high molecular weight components are also the most difficult to remove during refining. The transfer of color (from syrup to crystal) is much higher in cane sugar processing than in beet sugar processing. White beet sugar, with color of 20-30 IC, can be boiled from 2000-3000 IC color syrup, but only from about 200 IC cane syrup. In chromatographically separated beet molasses extract, the color of the syrup can be as high as 5000-7000 IC and still produce a 30-45 IC sugar. What is the reason for this? We present recent studies that compare beet sugar and cane sugar colorant and polysaccharide. The results indicate that beet and cane colorant are fundamentally different. Beet colorant tends to be produced during processing, mainly from alkaline degradation of invert and melanoidin formation. There is a tendency for this type of colorant to increase during processing. Cane colorant enters the process in the cane juice as plant pigments associated with polysaccharide, and changes little in process, due to the milder conditions associated with cane processing. Cane colorant has a strong affinity for the sugar crystal, whereas beet colorant has less affinity, is of a lower molecular weight than cane colorant, and has much less associated polysaccharide.