

Investigation of Soluble Impurities in Sugar Juice Manufacturing Process

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Dust particles, mud and sand particles, dead and live animals, and dry plant biomass had been reported in initial stage of crushing sugar cane. The major goal of this work is to investigate the percentage of soluble mud, sand, dust, biomass, and other contaminants in the sugar juice used to make brown sugar. Further investigations were done to find out percentage of juice loss with bagasse and mud filter cake. During the milling of sugarcane, extraneous contaminants are mixed with sugar juice. Those extraneous contaminants were impact the sugar quality. Brix value (percent soluble solids) was measured on a Brix meter at 20 °C of sugar juice before and after remove the soluble impurities and to remove soluble impurities, juice was filtered through filter paper applying lead acetate as a catalyst to solidification of soluble impurities in sugar juice. Juices extracted from various stages of the sugar making process were used to determine the impurities percentage of sugar juice. Findings are showing that, first mill juice (juice extracted from first mill), last mill juice (extracted juice from last mill), mixed juices (after mixing juices extracted from all mills together), clarified juices (after clarification process) and final product (sugar) average impurities percentages are 16%, 22%,16%,15% and 3% respectively. The polarization (Pol) value of bagasse (residue left after the extraction of juice from sugar cane) and mud filter cake (remove mud from clarification process) was measured on a polarimeter. As a result, was determined average percentage of the sucrose loss with bagasse and mud filter cake are 2.01% and 2.21% respectively. A conclusion could draw the presence of impurities in the juice extracted after the milling of sugar canes and the presence of a significant percentage of impurities in the juice even after the clarification stage. As well the final product sugar also contains a significant percentage of impurities, and it is affected quality of sugar. The amount of sucrose loss with bagasse and mud filter cake has a limitation rated value 2% and compare with result, sucrose loss with bagasse and mud filter cake exceeded rated value. The sucrose loss directly affects to decrease the productivity. As stated above, the outcome demonstrated that main reason of decrease sugar quality, soluble impurities were directly impacted and in clarification process soluble impurities was removed difficult. Another finding indicated that there was sucrose loss when bagasse and mud filters were removed. Therefore, could be removed impurities before milling the sugarcane to increase the quality of the final product and decrease sucrose loss.

Keywords: Bagasse, Brix value, POL value, Soluble impurities, Sugarcane