

Determination of Aspartame Using Uv-Vis Spectroscopy (Ultra Visible Spectroscopy) in Soft Drinks

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Structured Abstract

Background: The study of aspartame in soft drinks holds a significance importance due to its role as a low-calorie sweetener. Aspartame might be a better solution for those who are overweight, which requires them to consume fewer calories. However, consuming soft drinks containing a high concentration of aspartame is linked to the tendency likelihood of being overweight, experiencing high blood pressure and disability. Regrettably, obtaining precise information regarding the exact concentration of aspartame in soft drinks is challenging due to the absence of a legal requirement for manufacturers to disclose the quantity of aspartame used. Thus, the objectives of this study are to determine the physicochemical properties of soft drinks and the actual concentration of aspartame in soft drinks.

Methods: The physical properties of soft drinks are determined by using pH meter for pH, refractometer for brix, SG bottle for density, Brookfield viscometer for viscosity and chromameter for colour while for the chemical properties which are total sugar content and total soluble content are using uv-vis spectrophotometer at 620 and 490nm, respectively. The concentration of aspartame was determined by using double beam uv-vis spectrophotometer at 224nm.

Results: The pH, brix, density, viscosity, colour, total sugar content and total soluble content values obtained (Original Pepsi: 2.64, 5.23, 1.01 g/cm^3 , 12.63, 63.97, 0.081 g/mL and 0.042 g/mL, respectively, Bold (No Calorie) Pepsi: 2.98, 0.30, 0.96 g/cm^3 , 10.53, 63.66, 0.046 g/mL and 0.027 g/mL, respectively, Bold Lime: 2.97, 0.33, 0.98 g/cm^3 , 11.83, 46.57, 0.047 g/mL and 0.029 g/mL, respectively, Bold Vanilla: 3.00, 0.33, 0.97 g/cm^3 , 11.10, 46.22, 0.059 g/mL and 0.036 g/mL, respectively, 7up (Zero Calorie): 3.17, 0.13, 0.93 g/cm^3 , 9.83, 29.83, 0.037 g/mL and 0.015 g/mL, respectively). The highest aspartame concentration is found in Original Pepsi at 0.042 g/mL. These results confirm that Original Pepsi contains sugar and use aspartame as a sweetener. This study also provides recommendations for aspartame intake in which adults weighing 70-80 kg can safely consume up to 250 mL per day.

Conclusion: In conclusion, the findings of this study indicated that there is a significant difference in terms of physicochemical properties and the aspartame concentration between five soft drinks.

Keywords: Aspartame, Pepsi, 7up

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