

## **Application of Refractometric Methodology for Simultaneous Determination of Alcohol and Residual Sugar Concentrations during Alcoholic Fermentation Bioprocess of Date Juice**

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**Abstract :** Determining the alcohol content in alcoholic fermentation bioprocess is of great importance. In fact, it is a key indicator for monitoring this bioprocess. Several methodologies (chemical, spectrophotometric, chromatographic) are used to the determination of this parameter. However, these techniques are very long and they require: rigorous preparations, sometimes dangerous chemical reagents and/or expensive equipment. In the present study, the date juice is used as the substrate of alcoholic fermentation. The extracted juice undergoes an alcoholic fermentation by *Saccharomyces cerevisiae*. The study of the possible use of refractometry as a sole means for the in situ control of alcoholic fermentation revealed a good correlation ( $R^2=0.98$ ) between initial and final °Brix:  $^{\circ}\text{Brix}_f=0.377\times^{\circ}\text{Brix}_i$ . In addition, the relationship between  $\Delta^{\circ}\text{Brix}$  and alcoholic content of the final product (A,%) has been determined:  $\Delta^{\circ}\text{Brix}/A=1.1$ . The obtained results allowed us to establish iso-responses abacus, which can be used for the determination of alcohol and residual sugar content, with a mean relative error (MRE) of 5.35%.

**Keywords :** alcoholic fermentation, date juice, refractometry, residual sugar

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