VERY HIGH GRAVITY SUCROSE FERMENTATION BY FUEL-BIOETHANOL PRODUCING YEASTS STRAINS USING HIGH CELL DENSITY: EFFECT OF CELL RECYCLING

MIRANDA Jr, M.; ERNANDES, J. R.
Departamento de Bioquímica e Tecnologia Química, Instituto de Química, State University of São Paulo (UNESP), POBox 335, 14801-970 - Araraquara, SP, Brazil.

Sucrose fermentations, main carbohydrate in brazilian ethanol fuel must, were conducted in very high gravity process by industrial yeasts strains. In this study four *Saccharomyces cerevisiae* Ethanol RED®, SA, PE and VIN 13 industrial strains were used to ferment sucrose 30% (w/v), in based sugar cane industrial must or in medium supplemented with peptone and yeast extract, under aerobic and anaerobic conditions. For the consecutive fed batch fermentation process, yeast cells were separated from fermentation broth and re-used repeatedly in the multistage fermentation. Despite decreased fermentaion performance with cell reutilization, for all strains in very high gravity conditions with high cell density, were observed efficient fermentation performance at 28, 30 and 32° C, obtaining wines with 16-17% (v/v) ethanol. Higher levels of trehalose accumulation was observed in the presence of ethanol, when compared with conditions without ethanol, suggesting industrial strains ability to adapt to stress conditions induced by ethanol. Nitrogen supplementaion also induced improved fermentaion performance. The results shown in this work have industrial relevance since indicate that efficient sugar convertion, with high levels ot ethanol production can be obtained a from very high gravity sucrose fermentation, depending on finding of ideal fermentation conditons in the multistage system such as fermentation time, cell recycling and appropriate nutritional strains status, mainly to atend yeast nitrogen demand.

FAPESP, CAPES