EFFECT OF $^{60}$Co RADIATION ON SOME CHEMICAL CHANGES IN POTATO STARCH PASTES AND GELS

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Received 16 April 1987
Accepted 26 April 1987

The effect of ionizing radiation /$\gamma$-$^{60}$Co/ on some chemical changes in potato starch pastes stored for 14 d at 4-5 °C and prepared from the starch irradiated in the range of doses 1.5-15 kGy has been studied. It was found that along with the increase in the doses used, the viscosity of pastes as well as the pH of solutions decreased. On the other hand, the increase in the concentration of reducing sugars was observed. The retrogradation of pastes was found to be inhibited by increasing doses of radiation pointing out that ionizing radiation has a favourable effect on their stability during the time of storage.

INTRODUCTION

Retrogradation is a term given to the changes which occur in a starch paste or gel on ageing. According to Katz, retrogradation is basically a crystallization...
process and can be detected by the changes in the X-ray diffraction patterns.

Radiation preservation of starch by the use of $\gamma$-60Co radiation improves the hygiene and stability of starch products /instant fruit creams, puddings etc./ as well as pastes and gels important for preparing baby food. Retrogradation processes are also responsible for bread staling\textsuperscript{3}. Especially in this case appears the acute problem of elimination of pathogenic microflora, because the process of thermic treatment is minimized. Therefore, ionizing radiation creates the possibility of replacing strongly controversial chemical agents and improving the hygiene of products in continuous processes using light and elastic packages preventing the final product from the secondary microbial contamination.

The aim of our work was to study the effect of ionizing radiation on some physico-chemical changes occurring in 3% starch pastes obtained from potato starch previously irradiated in $^{60}$Co radiation source with the doses 1.5, 3.0, 6.0, 9.0 and 15 kGy and stored for 14 d at a temperature 4-5 °C. A special attention was paid to the changes in retrogradation with the dose of radiation.

**Materials and methods**

For these studies, potato starch /Superior/ of domestic production was used. Moisture content - 12%. Starch samples were irradiated in glass ampoules in the presence of air in a radiation facility of the Institute at a dose rate of 6 kGy h\textsuperscript{-1}. The starch pastes and gels were prepared by the method of Kiyoshi Kubota\textsuperscript{4}. The determinations of viscosity were performed using Rheotest 2 /GDR production/ at 30 °C. For pH estimations, pH-meter LBS /Polish production/ with a universal electrode was