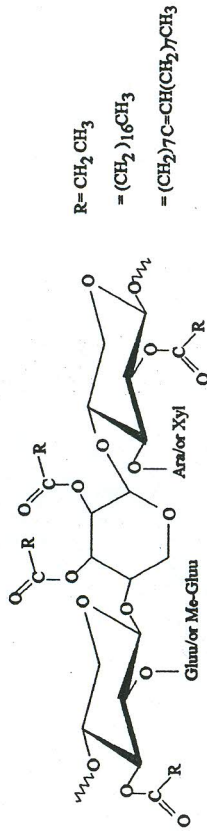


Wheat straw hemicelluloses



R = CH₂CH₃
 = (CH₂)₁₆CH₃
 = (CH₂)₇C=CH(CH₂)₇CH₃

Treatment of cellulosic wastes by electron beam irradiation and gaseous ammonia

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Abstract

In Brazil upgrading of agricultural wastes into useful end-products can be expected not only to recycle the agro-resources but also to reduce pollution. The improvement of its quality is essential for celluloses to be used for animal feed since the nutritive values of them are poor. Ionizing radiation can be used to degrade cellulose in order to increase the digestibility and the ammonia could be used to increase nitrogen content of those materials. For a microscopic analysis, a combination of electron beam (EB) irradiation followed by gaseous anhydrous ammonia treatment on cellulosic wastes such as sugarcane bagasse, cotton straw, rice straw and rice hull was applied. EB irradiation was carried out with an accelerator Dynamitron (Radiation Dynamics, Inc.), energy 1.4 MeV, current 13.4 mA, doses 200 and 400 kGy. Cells were separated using a Franklin maceration solution modified by Normand, dyed with safranin and observed under a Zeiss transmission and polarizing microscope. The degradation of the cellulose and the hemicellulose by radiation occurs by a process of depolymerization as can be seen even macroscopically. However, aromatic compounds from the lignin and other extractives seems to act as protective components against the radiation-induced scissions in the cellulosic matrix. The treatment and the doses used in this work was not enough to cause a drastic morphological changes within the fibres and the tracheary elements of sugarcane bagasse, cotton and rice straws, being of limited efficiency on rice hull.

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 EMPRÉSTIMO