

TECHNICAL NOTES

FOREST PRODUCTS LABORATORY

U. S. FOREST SERVICE

MADISON, WISCONSIN

LO-11
284

No. E-3

ETHYL ALCOHOL FROM WASTE SULPHITE LIQUOR USING AN ACCLIMATED YEAST

Results obtained from a series of investigations by the Forest Products Laboratory at Madison, Wisconsin, upon the production of ethyl (grain) alcohol from sulphite pulp mill waste liquor are as follows:

Of the 2.0 to 2.9 per cent total sugars found in waste sulphite liquor, about 55 to 62 per cent are fermentable and upon fermentation go to produce only ethyl alcohol.

Fermentations of the sulphite liquor conducted both on experimental and commercial scales showed a production of 0.7 to 1.15 per cent by volume of absolute alcohol. A plant with a capacity of 100,000 gallons of waste liquor would thus be able to produce 700 to 1,150 gallons of absolute alcohol per day. Since the alcohol produced from this source contains a small quantity of methyl alcohol but little further denaturing is necessary.

A comparison of yeasts showed that a yeast acclimated to sulphite liquor just prior to fermentation gave higher yields of alcohol than one which had been permanently acclimated to this liquor. The cost of the former process was enough greater, however, to discourage its use. This fact led the Laboratory to permanently acclimate a strain of beer yeast to this liquor and a culture was produced which gave results comparing very favorably with those obtained by the use of a freshly acclimated yeast.

A quite common custom of calculating alcohol yields from the sugar which disappears during a fermentation has been shown fallacious, since in some cases part of the sugar removed by fermentation forms substance other than alcohol.