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RECORD TYPE : F  
SUB TYPE : S  
SECURITY CODE :  
FUNDING BODY :  
ORGANIZATION : IITL CANADA  
GROUP NUMBER :  
LOCAL PROJECT NUMBER(S) : C-6542;R-7-1-1  
PROJECT TITLE : Lab. Scale Preparation of Reconstituted Tobacco Sheets  
PERSON RESPONSIBLE : DE GRANDPRE, Y.  
EFFORT : 1989  
PROJECT DESCRIPTION : The objective of this project is to explore approaches for producing small quantities of reconstituted sheet from untreated tobacco residues. Cigarettes made from shredded sheets will be smoked and the mutagenicity of their condensate evaluated with the Ames procedure. The effect of physical parameters (sheet thickness) and chemical composition (flavours and humectants) on the Ames biological activity of the sheet will also be considered. The Gerlach process will be the first process investigated since it produces a sheet with low Ames biological activity .

SCOPE : GROUP  
DEPTH : FUNDAMENTAL  
FUNCTION : GENERAL  
OBJECTIVE : REGULATORY  
CLUSTER : BIOLOGY

DATE REVIEW WRITTEN : July 1989  
REVIEW TITLE : Lab. Scale Preparation of Reconstituted Tobacco Sheets  
REVIEW TEXT : The Gerlach process (see IITL Progress Report June '88 - Jan '89) was used to prepare reconstituted tobacco sheets with three different ranges of thickness: less than 0.15mm; between 0.15 and 0.25mm and more than 0.25mm. The sheets were shredded and hand-made cigarettes were prepared from these tobaccos. An Ames test was conducted on cigarettes made with each of these ranges of thickness in order to investigate the effect of sheet thickness on the mutagenic activity of the cigarette smoke condensate. The Ames tests results indicated that the specific mutagenic activity increases as the Gerlach sheet thickness increases:

<u>Sheet Thickness</u>	<u>Sp. Act. (rev/ug)</u>
< 0.15mm	0.64
0.15 - 0.25mm	0.75
> 0.25mm	0.79

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We also prepared "aqueous" Gerlach sheets in which the organic solvent, a mixture of methylene chloride and methanol, was replaced by water during the preparation of the sheet. The results of an Ames test performed on aqueous and organic samples showed that cigarettes prepared from the organic solvent Gerlach sheet had 20% less mutagenic activity than cigarettes prepared from the aqueous Gerlach sheet. The use of low boiling point solvents like methanol (b.p.: 65°C) and methylene chloride (b.p.: 40°C) cause the formation of a porous sheet when these solvents evaporate during the drying stage. Since the organic Gerlach sheet is less dense than the aqueous Gerlach sheet it combusts more efficiently and this might be the reason for the reduced levels of mutagenic smoke components.

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