

THE ANTIOXIDANT ACTIVITY OF TOBACCO SMOKE - M. Johnson, Imperial Tobacco Products Ltd., P.O. Box 6500, Montreal, Canada.

The present investigation was undertaken to determine whether or not smoke stimulates or promotes the formation of radical peroxides which would in turn lead to lipid oxidation. Utilizing a system involving the coupled oxidation of B-carotene and linoleic acid, a system which serves as an assay for antioxidants, it was found that smoke did not contribute to the oxidative destruction of B-carotene, but rather behaved as an antioxidant.

We found smoke vapour to be highly antioxidant. Vapour phase from a number of tobacco types has been tested and compared with known antioxidants. For comparison, units of activity were expressed as the rate of change of O.D. with time. The antioxidant response of BHT, a model antioxidant, was used as a standard against which samples were ranked. We have also tested a number of pure vapour phase components and found the bulk of activity to be due to HCN and unsaturated compounds.

Smoke condensates were also found to have high antioxidant activity. TPM from different tobacco types were compared and differentiated according to relative efficiencies of antioxidant activity. TPM from cigarettes made from reconstituted tobacco and flue-cured cigarettes were found to be more efficient antioxidants than cigarettes made from air-cured tobacco and cigarettes made from stem. Cigar tobacco had similar activity to air-cured cigarettes, while pipe tobacco was least active. Fractionation of the total condensate, showed antioxidant activity in the neutral and water-insoluble acidic fractions, with virtually no activity in the basic fractions.

The mode of antioxidant action of tobacco smoke is discussed in terms of free radical mechanisms involving atom transfer, addition, substitution, and coupling.

1105170114