

variable rates via a programmable servomechanism. The heat output of this heater is variable but well-defined. The moving rate of the heater is adjusted to simulate any desired smoldering rate of a real cigarette. During experimentation, the fabric sample is mounted on an aluminum stage and is exposed to the simulated cigarette. The quantity of heat required to ignite the fabric sample is then determined. The effect of variations in cigarette Linear Burn Rate (LBR) on fabric ignition and smolder are analyzed using Infrared Thermographic techniques. Results indicate that the heat output needed to ignite a sample varies with the type of fabric used, the rate of motion of the simulated cigarette and its heat output.

12:00 Noon **Lunch**
Tuesday

TUESDAY MORNING, SEPTEMBER 16, 1997

SESSION B

Session Chair: Leslie S. Lewis

43

8:30 AM
Tuesday
Session B

INVESTIGATION OF TOTAL SMOKE EMISSIONS WHEN CIGARETTES ARE EVALUATED WITH AN EXTREME AND ARTIFICIAL SMOKING CONDITION.

Michael F. Borgerding¹ and W. S. (Bill) Rickert², ¹R. J. Reynolds Tobacco Company, Winston-Salem, NC 27102-1487, USA, ²Labstat Incorporated, Kitchener, ON, Canada N2C 1L3, ON

The smoke chemistry from Eclipse, a cigarette which burns a limited amount of tobacco, has been compared with that from five U.S. market cigarettes using an extreme and artificial smoking condition. Cigarettes were evaluated with a 56/26/2 puffing regimen (56 cc puff volume, a puff initiated every 26 s, 2 s puff duration) after taping the filter ventilation holes closed (100% vent blocking). As a result of the extreme condition, some discoloration of the Eclipse cigarette rod was observed after smoking. Total smoke emissions were determined for each cigarette sample by individually measuring mainstream and sidestream smoke yields. While the total smoke emissions from other cigarettes were derived from both mainstream and sidestream smoke contributions, Eclipse total smoke emissions were derived primarily from mainstream smoke. Analytes investigated in this work included, "tar", nicotine, carbon monoxide, eight

carbonyl compounds, seven phenolics, two aromatic hydrocarbons and benzo(a)pyrene. By chemical class, Eclipse total smoke yields were substantially less than yields for other cigarettes (~60 - 95%). Mainstream smoke total particulate matter materials mass balance results suggested that the chemical composition of Eclipse "tar" was different from other cigarettes. Eclipse mainstream smoke particles were rich in glycerol and water (~85% of the total mass). Materials other than glycerol and water accounted for approximately 50 - 55% of the particle mass from other cigarettes. A second Eclipse cigarette with a hollow tube filter design was also investigated, yielding similar results.

44

8:50 AM
Tuesday
Session B

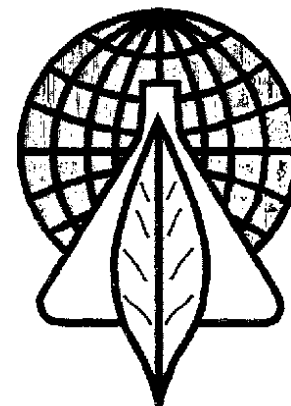
INITIAL DETERMINATION OF OCCUPATIONAL EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE AMONG NON-SMOKING RESTAURANT SERVERS AND BARTENDERS IN ONE U.S. CITY. Roger A. Jenkins, Amy B. Dindal, Michael P. Maskarinec, and Richard W. Counts, Oak Ridge National Laboratory, Oak Ridge, TN 37831-6120, USA

A study was conducted to determine personal exposure to environmental tobacco smoke (ETS) over one work shift of approximately 80 restaurant servers and 80 bartenders. Subjects were recruited through restaurant/tavern manager contact from facilities located within the Knoxville, Tennessee Standard Metropolitan Statistical Area. Subjects (non-smoking status confirmed by salivary cotinine analysis) wore a sampling pump system in a fanny pack which collected breathing zone samples of particulate and vapor phase components of ETS for a minimum of four hours over one work shift. Air samples were analyzed for respirable suspended particulate matter (RSP), ultraviolet absorbing and fluorescing particulate matter (UVPM and FPM), solanesol, 3-ethenyl pyridine, and nicotine. Not surprisingly, median levels of ETS constituents to which bartenders (not corrected for smoking status misclassification) were exposed (RSP, FPM, 3-EP, and nicotine: 118, 42, 1.29, and 4.89 $\mu\text{g}/\text{m}^3$, respectively) were greater than those to which waitresses and waiters were exposed (RSP, FPM, 3-EP, and nicotine: 73, 19, 0.57, and 0.96 $\mu\text{g}/\text{m}^3$, respectively). ETS levels to which bartenders working in single room bars were exposed were 5 - 15 times greater than those to which bartenders working in multi-room restaurant/bars were exposed. Other comparisons will be discussed. This research was sponsored by the Center for Indoor Air Research, Linthicum, MD, under contract no. ERD-88-812 with the Oak Ridge National Laboratory, managed by Lockheed Martin Energy Research Corp., Oak Ridge, TN, for the U.S. Department of Energy under contract number DE-AC05-84OR9622464.

51st Tobacco Chemists' Research Conference

PROGRAM

September 14-17, 1997
Winston-Salem, NC, USA



Volume 51

2063897024