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Rebuttal to Comment on Gas/Particle Partitioning of Two Acid−Base Active Compounds in Mainstream Tobacco Smoke: Nicotine and Ammonia

We note two errata in our paper (*1*): (1) we stated that all cigarettes were smoked to a 23 mm "butt length"; in fact, all filter cigarettes were smoked to within 3−5 mm of the overwrap paper; (2) the type of Virginia Slims tested were in fact Virginia Slims 100s (hard pack). Second, with regard to Lauterbach's objection that upward flow across the cigarettes was not discussed in the smoking protocol, smoking during our experiments occurred within a chemical fume hood that provided definite and complete removal of the sidestream smoke away from the burning cigarettes. Third, with regard to our decision to not pre-equilibrate cigarettes to a relative humidity (RH) of 60% prior to smoking, smokers do not carry out any such pre-equilibration, and in any case measurement of the RH within each pack upon opening was always in the range 57−65%. Fourth, Lauterbach comments about our per-cigarette "tar" and nicotine values measured for mainstream tobacco smoke (MTS) using (a) cigarettes purchased in 2007, (b) the Massachusetts Department of Public Health (MDPH) puffing protocol, and (c) our Teflon bag smoke sampling protocol. He provides a table of values "predicted" for the puffing protocol that we utilized. His "predicted" values were extrapolated on the basis of (a) "tar" and nicotine values obtained using the Federal Trade Commission (FTC) smoking protocol with cigarettes produced in 2005, (b) a "Cambridge" glass fiber filter (GFF) to collect smoke particulate matter (PM), and (c) FTC to MDPH conversion equations developed in the 1999 MDPH Benchmark Study. We have carried out analogous "predictions" using the more complex extrapolation equations developed by Counts et al.(*2*). By those equations for nicotine the average measured/"predicted" ratio for nicotine is 1.03. Although for "tar" the average measured/"predicted" ratio is <1.00, namely 0.51, we are confident that the values obtained using our smoking protocol were determined accurately. We ascribe any differences between our "tar" values for the cigarettes we purchased in 2007 and values "predicted" on the basis of data obtained for cigarettes manufactured in 2005 and PM sampling with a GFF to difficulties such as (a) differences between the cigarettes tested in 2005 and the cigarettes we purchased in 2007 and (b) possible confounding effects of the GFF surface on measurement of "tar" levels in other "standard" protocols.

LITERATURE CITED

(1) Chen, C.; Pankow, J. F. Gas/particle partitioning of two acid-base active compounds in mainstream tobacco smoke: nicotine and ammonia. *J. Agric. Food Chem.* **2009**, *57*, 2678–2690.

(2) Counts, M. E.; Morton, M. J.; Laffoon, S. W.; Cox, R. H.; Lipowicz, P. J. Smoke composition and predicting relationships for international commercial cigarettes smoked with three machine-smoking conditions. *Regul. Toxicol. Pharmacol.* **2005**, *41*, 185–227.

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