ANALYTICAL TECHNOLOGY DEPARTMENT

BAT

Test Report

BRITISH-AMERICAN TOBACCO COMPANY LTD
TECHNOLOGY CENTRE
Southampton England

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Subject: Advanced Analytical : 94-01-820

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Circulation

Sample(s) CA-94.0155/01

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Signed S. J. Stotesbury

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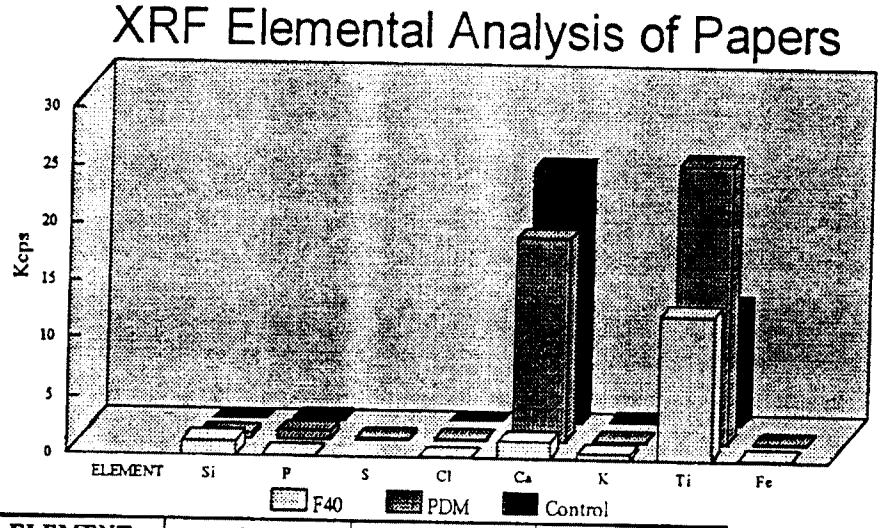
XRF ELEMENTAL SCAN OF TIPPING PAPER

Customer: M Maswood

From: S J Stotesbury
26 July 1994

Similar size pieces of tipping paper were cut out (2 cm x 2cm) and subjected to X-ray fluorescence spectrophotometry, scanning between 0.5 and 38.5 KeV.

A series of peaks were obtained for each paper sample, each peak representing an interaction between the X-rays and the atoms in the sample. The energy at which the interaction occurs is characteristic of a particular element; the intensity of the interaction is a measure of the concentration of that element in the sample. The results are summarised below.



ELEMENT	F40	PDM	CONTROL (TA 36)
Si	1.3	0.31	0.06
P	0.15	0.65	0.15
S		0.09	
Cl	0.07	0.1	0.08
Ca	1.5	17.5	22
K	0.55	0.05	0.12
Ti	12.5	24	10.4
Fe	0.18	0.1	

NB All figures quoted in terms of K counts per second.

The technique is semi-quantitative in the sense that only relative peak height values between the different samples are meaningful. (Absolute quantification is only possible when calibrated against homogeneous, matrix matched, solid standards.) You shouldn't try to read too much into the large differences in peak heights between different elements.

The most significant observations are:

- Phosphorous (phosphate) is a factor of 4 to 5 higher in the PDM paper compared to the other two samples.
- Calcium is a factor of 10 lower in F40 compared to the other two papers.
- Potassium is a factor of 5 to 10 higher in F40 compared to the other two.
- Titanium is a factor of 2 higher in PDM.
- Silicon is much higher in F40.

Can you let me know if/how this exercise needs to be followed up? Please note that I shall be out from 28 July until 8 August; sample requests should be submitted to Linda Drake.