

# Extraction of Nitrogen Compounds from Tobacco Waste via Thermal Treatment

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## Supporting information

**Table S1.** The main products of tobacco wastes during purge/trap-GC/MS.

Sample	Peak time (min)	Chemical formula	Chemical name	Percentage (%)
TW-1	5.38	C <sub>8</sub> H <sub>10</sub>	p-Xylene	1.88
	6.08	C <sub>8</sub> H <sub>8</sub>	Styrene	2.44
	14.96	C <sub>7</sub> H <sub>9</sub> NO	2-Amino-4-methylphenol	1.94
	18.84	C <sub>11</sub> H <sub>10</sub>	2-Methylnaphthalene	9.57
	19.74	C <sub>8</sub> H <sub>8</sub> O <sub>3</sub>	2-Hydroxyphenylacetic acid	23.20
	20.50	C <sub>10</sub> H <sub>16</sub>	3-carene	12.74
	20.91	C <sub>13</sub> H <sub>18</sub> O	β-damascenone	0.81
	22.70	C <sub>13</sub> H <sub>22</sub> O	Geranylacetone	1.65
	24.04	C <sub>19</sub> H <sub>22</sub> N <sub>3</sub> O	N-Benzyl-N-ethyl-p-isopropylbenzamide	18.59
TW-2	5.40	C <sub>8</sub> H <sub>10</sub>	p-Xylene	1.90
	6.10	C <sub>8</sub> H <sub>8</sub>	Styrene	2.49
	14.94	C <sub>7</sub> H <sub>9</sub> NO	2-Amino-4-methylphenol	0.35
	18.84	C <sub>11</sub> H <sub>10</sub>	2-Methylnaphthalene	2.61
	19.74	C <sub>8</sub> H <sub>8</sub> O <sub>3</sub>	2-Hydroxyphenylacetic acid	28.89
	20.51	C <sub>10</sub> H <sub>16</sub>	3-carene	16.66
	22.70	C <sub>13</sub> H <sub>22</sub> O	Geranylacetone	3.11
	24.04	C <sub>19</sub> H <sub>22</sub> N <sub>3</sub> O	N-Benzyl-N-ethyl-p-isopropylbenzamide	18.54
TW-3	5.39	C <sub>8</sub> H <sub>10</sub>	p-Xylene	1.38
	6.11	C <sub>8</sub> H <sub>8</sub>	Styrene	1.88
	14.96	C <sub>7</sub> H <sub>9</sub> NO	2-Amino-4-methylphenol	1.50
	18.87	C <sub>11</sub> H <sub>10</sub>	2-Methylnaphthalene	1.79
	19.74	C <sub>8</sub> H <sub>8</sub> O <sub>3</sub>	2-Hydroxyphenylacetic acid	24.91
	20.50	C <sub>10</sub> H <sub>16</sub>	3-carene	14.34
	22.71	C <sub>13</sub> H <sub>22</sub> O	Geranylacetone	1.47
	24.04	C <sub>19</sub> H <sub>22</sub> N <sub>3</sub> O	N-Benzyl-N-ethyl-p-isopropylbenzamide	20.54

TW-4	5.40	C <sub>8</sub> H <sub>10</sub>	p-Xylene	1.07
	6.11	C <sub>8</sub> H <sub>8</sub>	Styrene	2.97
	14.96	C <sub>7</sub> H <sub>9</sub> NO	2-Amino-4-methylphenol	1.39
	18.85	C <sub>11</sub> H <sub>10</sub>	2-Methylnaphthalene	2.12
	19.75	C <sub>8</sub> H <sub>8</sub> O <sub>3</sub>	2-Hydroxyphenylacetic acid	25.10
	20.51	C <sub>10</sub> H <sub>16</sub>	3-carene	16.09
	22.70	C <sub>13</sub> H <sub>22</sub> O	Geranylacetone	3.65
	24.04	C <sub>19</sub> H <sub>22</sub> N <sub>3</sub> O	N-Benzyl-N-ethyl-p-isopropylbenzamide	14.29

**Table S2.** Distributions of main organic species from tobacco wastes at different temperatures.

RT <sup>a</sup> (min)	Chemical name	Chemical formula	Yield (%)				
			280 °C	295 °C	310 °C	325 °C	340 °C
1.27	3-sulfo-L-Alanine	C <sub>3</sub> H <sub>7</sub> NO <sub>5</sub> S	2.26	3.55	1.86	0.94	3.21
1.40	1,2-Pentadiene	C <sub>5</sub> H <sub>8</sub>	3.03	1.99	1.16	-	1.84
1.62	3-Aminopyrrolidine	C <sub>4</sub> H <sub>10</sub> N <sub>2</sub>	3.05	2.58	2.54	1.58	2.51
1.62	2-methyl-Furan	C <sub>5</sub> H <sub>6</sub> O	5.73	4.84	-	3.56	4.69
1.95	Benzene	C <sub>6</sub> H <sub>6</sub>	1.41	-	1.16	2.57	1.34
2.29	2-methyl-Pentanal	C <sub>6</sub> H <sub>12</sub> O	1.48	-	-	-	3.05
2.63	Silver acetate	C <sub>2</sub> H <sub>3</sub> AgO <sub>2</sub>	3.38	6.55	-	-	3.77
2.79	Disulfide	C <sub>2</sub> H <sub>6</sub> S <sub>2</sub>	2.88	1.95	-	-	2.73
3.47	2-Propanoic acid	C <sub>3</sub> H <sub>7</sub> NO <sub>3</sub>	-	2.38	1.39	-	1.27
3.59	Acetic acid	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>	-	1.36	2.31	1.98	2.68
4.98	Methyl glyoxal	C <sub>3</sub> H <sub>4</sub> O <sub>2</sub>	-	-	2.78	-	-
6.02	p-Xylene	C <sub>8</sub> H <sub>10</sub>	-	-	1.58	-	-
6.42	2,4-dimethyl-Thiophene	C <sub>6</sub> H <sub>8</sub> S	-	-	2.05	1.35	-
7.39	3-Pyridine	C <sub>6</sub> H <sub>7</sub> N	-	1.03	1.22	-	-
17.42	Orcinol	C <sub>7</sub> H <sub>8</sub> O <sub>2</sub>	1.93	-	-	2.36	1.48
30.07	L-Alanine	C <sub>4</sub> H <sub>9</sub> NO <sub>2</sub>	1.05	2.22	-	2.16	-
35.39	2-Hexanone	C <sub>6</sub> H <sub>12</sub> O	-	-	-	2.52	-
45.75	(S)-3-(1-Methyl-2-pyrrolidinyl) pyridine	C <sub>10</sub> H <sub>14</sub> N <sub>2</sub>	45.17	48.24	56.85	63.26	48.96
46.91	Triacetin	C <sub>9</sub> H <sub>14</sub> O <sub>6</sub>	5.36	7.36	4.07	1.95	3.91
53.02	Nicotyrine	C <sub>10</sub> H <sub>10</sub> N <sub>2</sub>	-	-	2.99	2.16	-
55.68	1,2,3-Propanetriol	C <sub>5</sub> H <sub>10</sub> O <sub>4</sub>	9.72	3.88	5.20	2.20	4.64

<sup>a</sup>RT, run time of GC-MS.