

表3 Concentrations of some polynuclear aromatic hydrocarbons and heterocyclic compounds in tobacco smoke (with references^a)

Polynuclear aromatic compound	Cigarette main-stream smoke ($\mu\text{g}/100$ cigarettes)	Cigarette side-stream smoke ($\mu\text{g}/100$ cigarettes)	Cigarette smoke-polluted environments (ng/m^3)	Cigar smoke ($\mu\text{g}/100$ g)	Pipe smoke ($\mu\text{g}/100$ g)
<i>Polynuclear aromatic hydrocarbons</i>					
Anthanthrene	0.2-2.2 (7,23)	3.9 (7)	0.5 (8, 19)		
Anthracene	2.3-23.5 (20,22,23)			11.9 (3)	110.0 (3)
Benzo[<i>a</i>]anthracene	0.4-7.6 (1,20,22,23,28)			2.5-3.9 (13)	
Benzo[<i>b</i>]fluoranthene	0.4-2.2 (11,20,23)				
Benzo[<i>f</i>]fluoranthene	0.6-2.1 (11,22)				
Benzo[<i>k</i>]fluoranthene	0.6-1.2 (21,23)				
Benzo[<i>ghi</i>]fluoranthene	0.1-0.4 (34,36)				
Benzo[<i>a</i>]fluorene	4.1-18.4 (1,7,22)	75 (7)	39 (8)		
Benzo[<i>b</i>]fluorene	2 (11)				
Benzo[<i>ghi</i>]perylene	0.3-3.9 (7,11,22)	9.8 (7)	5.9-17 (8,19)		
Benzo[<i>c</i>]phenanthrene	present (30)				
Benzo[<i>a</i>]pyrene	0.5-7.8 (11,14,;17,20,23,24,28,32,33)	2.5-19.9 (7,27)	2.8-760 (5,6,26)	1.8-5.1 (3,13,14)	8.5 (3)
Benzo[<i>e</i>]pyrene	0.2-2.5 (7,20,22,23)	13.5 (7)	3-18 (8,19)		
Chrysene	0.6-9.6(1,4,10,11,20,22,23)				
Coronene	0.1 (30)		0.5-2.8 (19)		
Dibenzo[<i>a,c</i>]anthracene	present (30)				
Dibenzo[<i>a,h</i>]anthracene	0.4 (11)				
Dibenzo[<i>a,f</i>]anthracene	1.1 (7)	4.1 (7)	6 (8)		
Dibenzo[<i>a,e</i>]pyrene	present (30)				
Dibenzo[<i>a,h</i>]pyrene	present (30)				
Dibenzo[<i>a,f</i>]pyrene	0.17-0.32 (25)				
Dibenzo[<i>a,i</i>]pyrene	present (33)				
Fluoranthene	1-27.2(7,16,20,22,29,33)	126 (7)	99 (8)	20.1 (3)	
Fluorene	present (9,31)				
Indeno[1,2,3- <i>cd</i>]pyrene	0.4-2.0 (1,38)				
1-Methylchrysene	0.3 (10)				
2-Methylchrysene	0.12 (10)				
3-Methylchrysene	0.61 (10)				
4-Methylchrysene	present (31)				
5-Methylchrysene	0.06 (10)				
6-Methylchrysene	0.7 (10)				
2-Methylfluoranthene	present (22)				
3-Methylfluoranthene	present (22)				
Perylene	0.3-0.5 (23,30)	3.9 (7)	0.1-11(8,19)		
Phenanthrene	8.5-62.4 (20,22,23)			115 (3)	
Pyrene	5-27 (2,4,7,20,22,23,25,29,33)	39-101 (7,21)	2-66 (8,19)	17.6 (3)	75.5 (3)
Triphenylene	present (30)				
<i>Heterocyclic compounds</i>					
Carbazole	100 (15)				
Dibenzo[<i>a,h</i>]acridine	0.01 (35)				
Dibenzo[<i>a,f</i>]acridine	0.27 (35)				
7 <i>H</i> -Dibenzo[<i>c,g</i>]carbazole	0.07 (35)				
Benzo[<i>c</i>]fluorene	present (12,30)				
Dimethylphenanthrene ^b	present (30)				
1-Methylphenanthrene	3.2 (22)				

^aReferences: (1) Ayres & Thornton (1965); (2) Bonnet & Neukomm (1956); (3) Campbell & Lindsey (1957); (4) Ellington *et al.* (1978); (5) Elliot & Rowe (1975); (6) Galuškínová (1964); (7) Grimmer *et al.* (1977a); (8) Grimmer *et al.* (1977b); (9) Grob & Voellmin (1970); (10) Hecht *et al.* (1974); (11) Hoffmann & Wynder (1960); (12) Hoffmann & Wynder (1971); (13) Hoffmann & Wynder (1972a); (14) Hoffmann *et al.* (1963); (15) Hoffmann *et al.* (1968); (16) Hoffmann *et al.* (1972); (17) Hoffmann *et al.* (1974); (18) Hoffmann *et al.* (1975); (19) Just *et al.* (1972); (20) Kiryu & Kuratsune (1966); (21) Kotin & Falk (1960); (22) Lee, M.L. *et al.* (1976); (23) Masuda & Kuratsune (1972); (24) Müller, K.H. *et al.* (1964); (25) Müller, R. *et al.* (1967); (26) Perry (1973); (27) Pyriki (1963); (28) Rathkamp *et al.* (1973); (29) Severson *et al.* (1979); (30) Snook *et al.* (1977); (31) Snook *et al.* (1978); (32) US Department of Health & Human Services (1982); (33) Van Duuren (1958a); (34) Van Duuren (1958b); (35) Van Duuren *et al.* (1960); (36) Wynder & Hoffmann (1959); (37) Wynder & Hoffmann (1961a); (38) Wynder & Hoffmann (1963)

^bUnspecified isomer