

CHAPTER IV

RESULTS

The results of internal and external concentration of 29 elements in 50 human head hair samples, were summarized in table 4.1-4.4. Table 4.1 to 4.4 also included, the concentration of the bulk, essential, toxic and other elements in each sample, respectively. While the range, overall average and standard deviation of each element of the whole sample from males 18-32 years were listed in table 4.5. The proposed baseline value of each element in hair was also indicated in table 4.5.

Table 4.1 Concentration of bulk elements in hair (ppm)

sample No.	Ca $\times 10^2$		Cl $\times 10$		Mg $\times 10$		Na $\times 10$		K $\times 10$	
	I	E	I	E	I	E	I	E	I	E
A-3	8.828	1.817	37.988	48.060	6.165	2.499	1.300	11.718		
A-4	11.600	0.603	3.737	4.605	21.568	5.143	3.623	24.944		
A-22	8.079	2.396	3.993	0.045	17.821	0.552	3.726	6.808		
A-23	9.068	2.412	4.515	0.386	7.229	2.829	29.891	-0.196		
A-26	7.258	1.193	2.345	5.676	8.786	0.304	10.998	13.392		
A-28	7.205	6.741	2.772	12.672	12.073	11.932	86.243	11.398		
B-5	5.306	1.994	3.967	18.894	13.706	11.774	33.725	19.738		
B-10	10.920	2.060	3.060	6.958	14.936	-0.273	43.623	47.666		
B-11	3.884	0.067	3.315	17.252	2.633	2.321	1.785	43.509		
B-13	2.219	0.372	2.324	14.318	9.963	0.470	22.653	65.905		
B-15	5.738	2.229	3.002	13.627	7.132	2.326	33.665	3.334		
B-18	6.956	0.544	6.656	16.913	1.699	0.472	19.884	28.965		
B-22	2.713	0.013	5.640	22.137	1.493	11.922	3.979	6.491		
B-23	3.898	0.569	1.887	10.940	15.879	0.379	39.731	17.236		
B-24	2.402	2.199	4.138	20.094	2.332	0.039	13.373	34.900	11.112	25.179
C-1	6.438	0.59	4.936	44.670	5.860	2.232	14.970	22.115		
C-2	5.486	5.397	4.816	14.380	11.888	0.423	6.389	132.045	12.940	4.203
C-15	3.759	0.138	2.592	8.821	7.983	1.319	21.177	57.534		
C-16	1.922	0.233	4.024	18.743	1.957	2.717	31.549	41.591		
C-19	8.677	0.360	6.520	11.046	18.983	1.044	30.699	18.470		
C-21	8.352	0.336	2.210	2.876	5.428	1.904	10.419	35.104	97.982	1.121

Table 4.1 (Contd.)

sample No.	Ca $\times 10^2$		Cl $\times 10$		Mg $\times 10$		Na $\times 10$		K $\times 10$	
	I	E	I	E	I	E	I	E	I	E
C-25	11.506	0.678	1.712	17.192	12.141	1.904	18.943	20.467		
C-28	5.981	0.290	2.223	9.407	0.929	0.586	9.433	6.220		
D-2	6.554	-0.292	2.688	13.956	4.709	1.699	37.787	49.719		
D-6	4.435	1.019	3.070	3.835	4.459	0.035	43.767	48.766	51.035	36.399
D-7	2.321	0.050	1.424	9.239	2.929	3.210	46.462	4.441		
D-10	1.165	0.221	1.848	23.814	8.669	1.789	167.250	3.440		
D-17	2.911	2.270	4.695	13.465	5.500	0.040	22.256	29.815		
D-22	5.306	0.924	3.021	18.904	9.915	1.059	28.830	23.508		
D-23	9.326	0.285	2.138	4.020	14.470	6.147	19.547	15.752		
E-1	3.181	1.478	3.785	10.685	3.804	1.466	14.618	23.819	40.430	4.192
E-6	6.615	1.505	3.018	7.241	10.277	0.632	7.754	13.924	9.699	9.679
E-7	5.930	1.382	2.397	10.543	3.676	0.812	44.916	29.417		
E-8	1.466	8.922	8.580	3.053	5.748	0.603	Nodata			
E-13	5.220	0.862	3.004	12.059	12.943	0.300	86.464	154.58		
E-20	11.730	1.402	4.706	7.49	9.418	-0.104	25.427	58.491		
E-25	4.332	0.231	2.871	12.518	4.054	-0.108	20.805	10.355	44.106	106.911
E-26	1.964	-0.178	3.190	11.308	5.469	-1.79	38.513	0.748		
E-29	6.256	2.416	6.576	8.600	3.184	3.209	11.170	-0.618		
F-2	6.839	-0.421	5.930	4.310	8.136	-0.288	33.590	7.050	23.508	19.380
F-5	15.620	-3.939	7.243	2.101	19.662	-2.485	23.729	2.337		

Table 4.1 (Contd.)

Sample No.	Ca $\times 10^2$		Cl $\times 10$		Mg $\times 10$		Na $\times 10$		K $\times 10$	
	I	E	I	E	I	E	I	E	I	E
F-6	4.108	3.198	4.576	14.083	15.233	4.16	53.642	34.259		
F-11	22.930	-5.765	8.882	-1.671	14.260	0.440	11.250	5.336		
F-13	4.234	5.85	6.873	17.113	8.728	0.923	45.028	38.914		
F-21	6.783	0.777	10.756	20.325	7.327	0.721	13.159	0.817		
F-25	4.816	0.235	2.581	7.970	3.923	1.903	38.993	5.996		
F-26	8.640	1.078	5.994	16.520	10.080	4.581	30.585	30.144		
F-27	2.512	0.853	1.228	6.654	3.202	1.309	5.134	40.764	4.235	0.400
F-28	20.847	2.862	4.159	0.132	17.460	15.691	11.670	19.029		
F-29	16.568	-0.122	5.251	3.331	14.591	1.683	8.187	30.043		

I = Internal Concentration

E = External Concentration

Table 4.2 Concentration of essential elements in hair (ppm)

Sample No	Br		Fe		I		Mn		Snxlo ⁻¹		Znxlo	
	I	E	I	E	I	E	I	E	I	E	I	E
A-3	2.400	0.504	15.569	4.091	0.131	0.450	9.132	-0.225	0.32	0.55	16.730	0.167
A-4	0.512	0.791	14.326	1.071	0.241	0.048	6.034	1.746	0.67	0.39	19.751	4.483
A-22	0.512	0.203	8.219	1.938	0.358	1.076	2.984	1.342	0.33	0.25	8.267	1.287
A-23	0.333	0.012	15.990	3.741	0.358	0.449	5.832	1.096	1.01	0.59	12.656	5.107
A-26	0.137	0.035	20.837	6.167	0.146	0.399	8.085	1.899	No. data		18.042	3.960
A-28	0.724	0.202	10.825	1.135	0.193	0.692	5.869	0.436	1.03	0.49	9.756	0.145
B-5	0.986	2.896	13.789	3.753	0.209	0.026	4.912	1.095	0.83	Nodata	11.054	6.534
B-10	0.680	0.843	37.062	7.474	0.377	0.132	18.469	3.622	1.44	1.99	12.217	3.175
B-11	0.168	0.989	11.465	8.278	0.328	0.050	1.574	1.127	0.36	0.31	16.119	25.009
B-13	0.558	0.510	17.231	-0.193	0.311	0.226	1.443	0.406	0.53	0.03	23.007	2.082
B-15	2.092	0.885	17.853	0.906	0.270	0.086	2.261	0.228	0.47	0.07	14.314	0.551
B-18	0.493	-0.008	12.154	9.671	0.443	0.690	3.022	0.728	0.58	Nodata	10.761	3.541
B-22	0.110	0.818	22.321	2.505	0.102	0.176	0.705	0.268	0.04	0.37	14.705	-0.333
B-23	0.089	0.318	4.179	6.585	0.177	0.168	2.010	0.850	No. data		10.841	6.777
B-24	0.588	0.275	8.581	2.157	0.402	0.024	2.015	0.500	0.70	-0.00	4.885	2.813
C-1	1.907	1.222	11.866	6.190	0.407	0.811	2.055	1.717	1.18	0.03	11.426	11.745
C-2	0.328	1.209	11.921	19.783	No. data		3.908	1.457	0.49	1.00	12.743	1.352
C-15	0.251	0.323	7.094	2.823	0.321	0.039	3.810	0.160	N.D.	0.08	11.305	6.102
C-16	0.187	0.298	11.229	0.242	0.325	0.162	1.244	0.734	No. Data		13.362	0.362
C-19	0.286	0.880	9.379	4.034	0.113	0.485	6.200	0.264	0.54	nodata	9.885	2.704
C-21	0.297	0.249	4.864	0.581	0.247	0.010	4.884	0.414	0.64	0.01	7.185	1.411

Table 4.2 (contd.)

Sample No.	Er		Fe		I		Mn		Snxlo^{-1}		Znxlo	
	I	E	I	E	I	E	I	E	I	E	I	E
C-25	1.108	0.793	14.380	5.559	0.082	0.118	6.651	0.482	0.04	0.01	15.059	4.407
C-28	0.291	0.254	5.317	0.267	0.498	0.020	0.831	0.818	0.26	0.05	6.488	0.483
D-2	0.558	1.420	6.512	1.375	0.250	-0.004	3.614	0.644	0.41	0.02	9.802	4.458
D-6	0.344	0.602	8.533	0.270	0.080	0.074	8.520	0.017	0.46	0.00	5.613	0.045
D-7	0.300	0.229	4.485	2.036	0.318	0.175	5.149	0.603	N.D.	N.D.	6.252	0.390
D-10	0.227	1.032	36.940	1.481	0.172	0.020	3.810	0.207	N.D.	N.D.	48.567	7.313
D-17	0.600	0.862	7.840	0.640	0.344	0.439	6.166	0.140	N.D.	0.59	7.550	-0.083
D-22	0.350	0.146	11.578	4.093	0.463	0.303	4.809	0.879	0.10	0.08	7.885	5.642
D-23	0.242	0.819	27.378	5.349	0.052	0.131	5.428	0.517	0.03	0.01	23.536	2.017
E-1	1.411	1.570	33.166	7.782	0.598	0.133	2.024	0.226	0.81	0.04	21.111	3.882
E-6	0.294	0.034	3.793	1.273	0.297	0.071	1.660	0.909	0.23	0.37	10.658	0.835
E-7	0.368	0.727	8.092	2.286	0.201	0.047	1.933	0.007	0.24	0.07	15.132	0.655
E-8	1.728	0.173	9.175	3.141	0.200	0.299	0.140	0.383	1.33	0.61	53.271	5.879
E-13	0.507	0.873	16.293	13.519	0.556	0.029	7.766	0.402	0.04	0.03	37.788	3.311
E-20	0.698	0.104	2.469	0.898	0.596	0.431	10.086	2.252	0.11	0.02	38.378	3.758
E-25	0.192	0.183	3.972	1.735	0.368	0.117	1.078	10.570	N.D.	N.D.	6.227	1.289
E-26	2.780	1.959	6.411	2.210	1.390	-0.067	1.031	-0.057	N.D.	N.D.	8.369	-1.73
E-29	0.766	0.107	5.614	0.356	0.173	0.018	1.969	0.949	0.52	-0.12	10.972	-3.538

Table 4.2 (Contd.)

Sample No.	Br		Fe		I		Mn		Snx10 ⁻¹		Znx10	
	I	E	I	E	I	E	I	E	I	E	I	E
F-2	0.474	0.284	3.521	1.603	0.216	0.126	0.668	0.296	N.D.	0.08	6.412	-0.112
F-5	0.948	-0.46	42.636	-5.401	0.238	0.166	2.279	-0.55	0.59	0.05	52.277	-1.104
F-6	1.513	0.573	7.789	30.395	1.981	6.733	9.218	8.855	0.09	0.02	31.017	0.972
F-11	2.650	-0.767	51.278	-6.258	0.866	-0.183	5.683	-1.168	1.68	1.29	42.970	-4.802
F-13	0.741	0.669	15.345	1.647	0.776	1.605	2.093	0.556	0.02	0.03	34.738	8.137
F-21	1.730	1.226	13.879	7.801	0.363	0.027	7.426	0.803	0.67	0.84	26.840	1.358
F-25	0.261	0.223	9.332	1.275	0.450	0.686	0.508	0.337	0.30	0.11	8.154	7.298
F-26	0.948	0.115	12.723	11.037	0.609	0.245	2.560	0.980	0.03	0.04	62.333	5.432
F-27	0.233	0.250	8.474	3.263	0.492	0.014	1.038	0.304	0.40	0.18	21.824	3.658
F-28	6.666	0.969	2.931	0.131	0.456	0.098	3.623	0.521	0.05	0.02	22.664	2.799
F-29	6.726	6.867	25.717	7.176	0.173	-0.011	2.880	0.302	1.45	0.32	38.093	1.172

N.D. = Not Detectable

I = Internal Concentration

E = External Concentration

Table 4.3 Concentration of toxic elements in hair (ppm)

Sample No.	As		Co		Cr		Cu		Hg		Sb		Se		V	
	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
A-3	0.757	1.061	0.031	0.007	0.737	0.125	8.096	0.762	1.273	-0.073	0.047	0.002	0.045	0.185	0.089	0.001
A-4	0.774	0.347	0.035	0.023	0.565	0.039	3.862	-0.059	0.936	0.123	0.040	0.002	0.638	0.051	0.044	0.011
A-22	0.316	0.082	0.014	0.002	0.305	0.032	0.770	1.587	1.670	0.312	0.020	-0.001	0.360	0.072	0.021	0.005
A-23	0.471	2.936	0.053	0.013	0.044	0.129	2.313	1.060	0.354	0.176	0.067	0.016	0.403	0.021	0.036	0.019
A-26	0.245	0.266	0.045	0.019	0.104	0.019	2.499	2.436	0.116	0.025	0.006	0	0.402	0.029	0.026	0.024
A-28	0.430	1.360	0.041	0.027	0.101	0.008	4.185	4.193	0.773	0.001	0.022	0.050	0.396	0.034	0.004	0.087
B-5	2.663	0.988	0.025	0.005	0.101	0.030	4.539	5.124	1.327	0.718	0.089	-0.004	0.418	0.218	0.254	0.191
B-10	2.484	0.727	0.067	0.011	0.203	0.139	1.895	2.150	0.422	0.044	0.027	0.005	0.278	0.054	0.023	0.023
B-11	0.677	0.370	0.040	0.017	0.036	0.069	3.350	0.782	0.264	0.022	0.004	0.130	0.171	0.211	0.199	0.007
B-13	0.326	0.101	0.015	0.001	0.468	0.117	1.980	3.308	0.855	0.407	3.480	0.096	2.885	0.615	0.142	0.106
B-15	0.629	0.376	0.032	0.019	0.022	0.016	2.651	-0.027	0.259	0.090	0.012	0.004	0.562	2.085	0.026	0.034
B-18	1.120	-0.172	0.015	0.007	0.209	0.182	4.135	15.718	0.303	0	0.014	0.067	0.516	0.480	0.039	0.007
B-22	0.585	0.614	0.012	0.002	0.088	0.028	4.809	-0.003	1.250	-0.389	0.009	0.006	0.923	0.232	0.211	0.008
B-23	5.065	0.228	0.110	0.005	0.048	0.218	1.999	3.724	0.077	0.073	0.011	0.008	0.267	0.028	0.014	0.017
B-24	1.286	-0.006	0.020	0.004	0.135	0.325	3.523	1.279	2.567	1.150	0.007	0.004	0.628	0.124	0.141	0.062
C-1	2.563	0.238	0.013	0.004	0.113	0.133	3.593	0.281	4.342	0.627	0.042	0.073	0.965	0.293	0.169	0.064
C-2	1.701	2.955	0.023	0.002	0.312	0.063	4.894	-0.013	0.444	0.530	0.008	0.020	0.195	0.418	No. Data	
C-15	1.763	1.305	0.015	0.013	0.056	0.009	3.280	0.036	0.358	0.173	0.012	0.017	0.476	0.150	0.013	0.003
C-16	1.458	1.222	0.030	0.002	0.191	0.047	2.220	2.887	0.346	0.004	0.052	0.016	0.470	0.010	0.013	0.063
C-19	0.817	0.623	0.031	0.017	0.125	0.002	3.440	6.498	0.307	0.082	0.026	0.050	0.199	0.617	0.058	0.004

Table 4.3 (Contd.)

Sample No.	As		Co		Cr		Cu		Hg		Sb		Se		V	
	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
C-21	0.919	0.610	0.008	0	0.116	0.030	3.151	3.298	0.883	0.213	0.003	0.001	0.233	0.040	0.149	0.004
C-25	1.219	0.332	0.065	0.032	ND	ND	3.743	1.197	1.303	0.727	0.005	0.020	N.D.	2.290	0.096	0.025
C-28	0.628	0.258	0.004	0.019	0.069	0.028	2.428	1.334	0.058	0.516	0.003	0.008	0.164	0.012	0.231	0.101
D-2	1.602	0.765	0.014	0	0.138	0.127	5.411	7.935	1.647	0.637	N.D.	0.018	0.313	0.258	0.211	0.004
D-6	1.100	1.025	0.010	0.003	0.123	0.034	1.964	1.522	0.044	0.048	0.004	0.004	12.34	0.0800	0.154	0.059
D-7	0.095	0.005	0.009	0	0.063	0.031	6.256	4.267	0.773	0.063	0.002	0.002	0.285	-0.003	0.135	0.012
D-10	1.551	0.294	0.281	0.045	0.737	0.002	15.267	7.311	1.080	0.282	0.326	0.088	8.359	2.616	0.063	0.003
D-17	2.433	0.161	0.021	0.004	0.158	0.022	3.642	2.776	1.636	0.086	0.004	0	0.354	0.012	0.055	0.017
D-22	2.413	0.862	0.040	0.003	0.216	0.002	3.890	5.852	0.204	0.163	0.034	0.011	16.340	0.195	0.081	0.001
D-23	0.704	0.019	0.174	0.010	0.026	0.027	3.922	1.480	0.221	0.013	0.083	0.137	2.764	0.226	0.036	0.010
E-1	8.402	0.958	0.019	0.003	0.324	0.155	3.827	1.147	4.040	0.624	0.015	0.019	1.356	-0.046	0.184	0.010
E-6	0.600	1.066	0.006	0	0.080	0.078	3.364	0.080	0.746	0.003	0.014	0.036	0.300	0.013	0.145	0.303
E-7	2.482	1.178	0.004	0.015	0.070	0.174	3.037	-0.105	0.950	0.039	0.003	0.009	0.489	0.032	0.204	0.001
E-8	5.745	3.125	0.005	0.004	0.236	0.005	1.140	3.527	3.030	0.037	0.033	0.027	1.358	0.459	0.063	0.139
E-13	1.365	0.565	0.231	0.007	0.063	0.033	1.891	2.136	1.591	0.017	0.048	0.080	0.901	0.201	0.151	0.080
E-20	1.950	0.362	0.053	0.018	ND	ND	2.191	0.412	0.776	-0.001	0.004	0.004	1.344	1.315	0.044	0.003
E-25	0.584	0.056	0.004	0	0.034	0.023	2.971	2.342	0.478	0.148	0.002	0.002	0.150	0.010	0.126	0.090
E-26	1.599	-0.161	0.026	-0.006	0.140	0.002	3.620	2.270	0.900	-0.178	0.007	-0.004	0.269	0.031	0.236	0
E-29	0.860	0.715	0.010	-0.006	0.153	0.065	6.428	-0.621	1.752	-0.616	0.002	0.006	0.284	-0.051	0.143	0.092

Table 4.3 (Contd.)

Sample No.	As		Co		Cr		Cu		Hg		Sb		Se		V	
	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
F-2	1.002	0.991	ND	0.005	0.093	0.014	3.603	0.018	0.867	0.009	0.003	0.007	0.304	0.022	0.183	0.035
F-5	1.434	0.546	0.031	0.021	0.601	0.093	4.536	-0.531	0.466	0.237	0.029	0.008	0.212	0.01	0.113	0.143
F-6	0.665	0.403	0.098	0.005	ND	ND	2.603	1.592	0.554	1.725	0.006	0.007	77.634	14.126	0.070	0.004
F-11	1.497	1.191	0.117	-0.081	0.627	0.023	5.810	-0.563	4.503	-0.672	0.132	-0.094	2.550	-0.385	0.411	-0.153
F-13	1.027	0.259	0.069	0.011	0.342	0.298	15.350	2.231	0.692	0.182	0.162	0.072	4.195	0.565	0.020	0.031
F-21	2.494	0.239	0.020	0.006	ND	0.435	2.862	1.766	2.983	4.214	0.024	0.007	1.176	0.079	0.135	0.025
F-25	4.960	0.021	0.016	0.012	0.101	0.021	6.377	4.292	0.207	0.147	0.081	0.027	0.210	0.087	0.032	0.024
F-26	0.327	0.481	ND	0.148	ND	ND	4.672	6.368	4.654	1.025	0.026	0.003	2.149	0.219	0.070	0.004
F-27	0.464	0.251	0.039	0.019	0.195	0.187	2.950	0.831	2.057	1.332	0.023	0.002	0.602	0.171	0.234	0.536
F-28	1.014	0.283	0.088	0.067	0.016	0.008	6.665	4.523	0.560	0.108	0.053	0.022	0.051	1.154	0.069	0.013
F-29	1.276	1.005	0.048	-0.002	0.146	0.504	3.107	1.925	2.462	0.277	0.029	0.022	0.561	1.153	0.046	-0.005

ND = Not Detectable

I = Internal Concentration

E = External Concentration

Table 4.4 Concentration of other trace elements in hair (ppm)

Sample No	Al		Agx10 ⁻¹		Aux10 ⁻²		Ba		Ce		Hfx10 ⁻¹		Lax10 ⁻¹		Rb		Sc		Ti	
	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
A-3	12.035	3.056	0.16	0.02	0.33	0.11	8.488	-0.220	0.324	-0.608			0.24	0.27	1.575	0.096			9.064	5.018
A-4	9.834	1.275	0.14	0.04	0.62	0.33	6.792	1.317	0.244	0.075			0.21	0.08	0.939	0.365			4.873	5.925
A-22	11.430	1.072	0.06	0.01	0.25	0.13	3.373	0.202	0.570	0.144			0.07	0.01	0.474	0.235			3.199	0.240
A-23	8.591	3.699	0.46	0.24	0.12	0.02	6.271	1.481	1.289	1.051			0.20	0.04	0.371	0.032			4.048	0.141
A-26	4.993	11.366	0.28	0.02	1.18	1.17	8.052	3.243	No data		0.11	0.11	0.39	0.71	0.362	0.072			2.813	4.484
A-28	8.840	22.891	0.22	0.12	0.33	0.20	3.850	0.734	0.679	1.229			0.14	0.18	0.289	-0.001			6.296	9.451
B-5	16.032	0.392	0.26	0.11	0.38	1.81	5.785	1.954	No data				0.67	No data	0.359	0.043			7.297	6.354
B-10	4.378	8.158	0.40	0.20	0.11	0.09	17.008	2.209	0.487	-0.096	0.20	0.12	0.16	0.48	0.487	0.117			4.389	0.228
B-11	13.456	3.447	0.29	0.28	0.63	0.26	6.894	0.220	0.321	0.578	0.12	0.11	ND	0.36	0.460	0.068			4.391	0.202
B-13	12.588	7.586	0.35	0.53	0.39	0.07	13.401	1.578	0.518	0.045	ND	0.26	ND	0.32	0.703	0.221			7.266	-0.176
B-15	7.717	1.747	ND	0.34	0.47	0.14	1.578	0.213	0.419	-0.019	ND	ND	0.13	0.05	0.230	0.230			7.835	-1.480
B-18	11.362	0.301	0.31	0.02	0.10	2.65	6.206	2.984	No data		0.26	0.03	0.46	0.46	0.719	0.115			7.213	0.577
B-22	11.254	8.748	0.38	-0.01	0.46	0.04	17.810	1.118	0.204	0.090	0.41	1.35	ND	0.42	0.272	-0.015			0.100	4.455
B-23	3.601	1.860	0.32	0.03	1.48	3.97	4.419	2.768	No data		0.17	0.41	0.10	0.02	0.518	0.684			8.010	1.308
B-24	9.815	3.303	1.02	-0.22	3.15	-1.26	9.934	3.106	0.643	0.101	ND	ND	ND	0.74	0.208	0.053			4.277	7.835
C-1	9.222	11.165	1.67	1.48	2.25	3.39	12.560	0.232	ND	ND	ND	ND	0.16	0.02	1.359	0.027			3.154	1.675
C-2	No data		1.08	4.20	2.44	2.45	7.613	5.154	0.693	0.578	ND	ND	0.24	0.03	0.270	0.535			No data	No data
C-15	5.788	2.939	0.55	0	0.99	2.23	2.029	0.590	0.206	-0.020	ND	0.90	0.04	0.05	0.847	0.093			6.245	2.173
C-16	10.059	10.033	0.60	0.13	1.64	0.20	12.442	1.858	No data		1.30	0.38	0.30	0.90	0.370	0.152			2.930	4.906
C-19	8.250	17.679	1.05	0.11	0.69	0.04	2.925	3.257	0.797	No data	ND	ND	0.14	No data	ND	ND			3.564	1.442

Table 4.4 (Contd.)

Sample No.	Al		Agx10 ⁻¹		Aux10 ⁻²		Ba		Ce		Hfx10 ⁻¹		Lax10 ⁻¹		Rb		Sc		Ti	
	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
C-21	8.723	2.917	0.56	0.10	0.60	0.56	7.237	3.653	0.326	-0.011	0.13	0.14	0.03	0.39	0.270	0.008			2.442	1.792
C-25	12.454	11.394	ND	ND	1.66	0.50	ND	ND	0.162	0.176	ND	ND	0.07	0.02	1.881	0.060			6.100	7.515
C-28	17.719	11.243	0.14	0.15	0.21	0.64	5.427	-0.109	0.020	0.011	0.007	0.13	0.08	0.08	0.310	0.080			4.765	3.030
D-2	11.610	1.939	0.34	0.06	0.47	0.11	10.971	0.605	0.413	0.215	ND	0.22	0.31	0.58	0.351	0.053	0.002	0	2.290	4.384
D-6	2.282	0.331	0.25	0	0.31	0.02	5.827	0.826	0.774	0.357	0.11	0.13	ND	ND	0.100	0.112			6.514	6.781
D-7	5.871	3.590	0.15	0.37	0.26	0.08	6.119	0.756	0.209	0.144	0.06	0.1	0.94	0.27	0.246	0.025			2.116	2.834
D-10	6.862	5.403	ND	ND	1.79	0.13	2.026	0.172	0.793	0.453	ND	ND	0.04	0.01	8.009	9.318			4.646	12.198
D-17	8.147	4.910	1.09	0.51	0.20	0.31	6.974	4.614	ND	ND	0.12	0.12	0.86	0.15	1.249	0.009			6.078	1.231
D-22	4.075	3.884	4.14	0.15	0.49	0.05	2.194	0.714	0.311	0.09	ND	ND	0.27	-0.05	0.268	0.054			4.200	6.572
D-23	6.455	4.520	ND	ND	0.13	0.01	0.929	-0.018	ND	ND	ND	ND	0.03	0.01	3.348	2.770			7.318	-0.204
E-1	11.840	6.404	2.13	2.21	0.23	4.46	2.497	7.240	1.026	0.228	ND	ND	4.20	0.26	0.922	0.411	ND	ND	2.241	1.930
E-6	9.191	6.450	0.17	0.48	0.19	0.14	2.215	1.028	0.039	0.305	0.05	0.75	0.18	0.39	0.391	0.346	ND	ND	1.448	0.883
E-7	8.458	4.760	0.46	1.20	0.31	0.18	3.426	2.618	0.463	0.094	0.22	0.23	0.29	1.07	0.209	0.176	0.002	C	5.840	-0.665
E-8	5.019	14.785	0.41	1.58	0.84	1.94	19.001	35.792	0.364	0.201	1.21	0.09	No data		0.655	0.285			1.905	1.393
E-13	8.421	9.356	ND	ND	0.33	1.45	3.188	0.490	ND	0.251	ND	ND	0.18	0.24	0.222	0.464			3.516	4.963
E-20	8.275	4.685	ND	ND	1.25	3.31	0.549	-0.003	0.553	0.727	ND	ND	0.01	0.06	ND	ND			7.124	1.302
E-25	9.053	3.911	0.12	0.14	0.74	1.18	3.368	1.158	0.196	0.025	0.04	0.02	0.41	0.20	0.210	-0.001			1.648	-0.304
E-26	17.473	1.742	0.32	0.08	0.57	0.44	7.214	2.238	0.551	-0.143	0.30	-0.18	1.02	-0.04	0.308	0.06	0.002	0	2.360	0.302
E-29	6.050	0.657	0.36	-0.09	1.39	1.64	3.576	1.142	0.559	-0.100	0.05	0.59	0.15	0.09	0.153	-0.517	ND	0.001	3.909	2.509

Table 4.4 (Contd.)

Sample No.	Al		Ag $\times 10^{-2}$		Aux $\times 10^{-2}$		Ba		Ce		Hfx $\times 10^{-1}$		Lax $\times 10^{-1}$		Rb		Sc		Ti	
	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
F-2	8.500	6.353	0.55	-0.05	0.32	0.31	1.253	1.181	0.195	0.183	0.10	0.60	0.57	0.15	0.167	0.005	ND	ND	1.624	2.933
F-5	3.710	4.871	0.24	0.64	0.09	1.67	24.041	2.817	0.798	0.127	0.72	0.17	ND	ND	0.922	-0.441	↑	↑	1.214	4.453
F-6	8.741	1.308	ND	ND	0.54	0.69	3.370	0.239	0.707	-0.011	ND	ND	0.12	0.03	8.475	1.000	↑	↑	4.164	3.354
F-11	27.523	11.857	0.43	-0.04	0.84	0.39	36.664	12.201	1.150	-0.095	2.84	0.24	ND	ND	0.450	0.187	↑	↑	10.344	-6.194
F-13	3.875	0.714	ND	ND	0.50	0.45	0.667	0.055	0.475	0.248	ND	ND	ND	0.06	ND	ND	↑	↑	1.825	0.946
F-21	3.968	3.742	0.28	-0.01	1.72	0.62	18.758	1.031	ND	ND	1.22	0.29	0.15	0.29	0.611	0.257	ND	ND	2.767	0.945
F-25	7.388	3.593	0.31	0.27	0.15	0.51	2.545	1.268	0.369	0.042	ND	ND	0.13	No data	0.408	0.019	↓	↓	5.224	0.501
F-26	105.165	125.165	ND	ND	0.31	0.88	0.304	0.780	0.974	0.076	ND	ND	0.05	0.15	ND	ND	↓	↓	8.951	0.190
F-27	9.538	11.231	0.37	0.01	0.46	0.15	7.393	0.192	0.368	0.414	ND	ND	ND	ND	0.201	0.019	↓	↓	0.156	3.269
F-28	2.586	3.556	ND	ND	2.70	0.78	0.338	0.391	0.314	0.065	ND	ND	0.05	0.10	2.724	1.398	↓	↓	5.093	1.804
F-29	7.578	4.262	0.18	0.28	3.83	7.25	10.916	1.481	0.982	-0.009	0.24	0.26	0.28	0.39	0.208	0.542	↓	↓	6.971	0.607

ND = Not Detectable

I = Internal Concentration

E = External Concentration



Table 4.5 Average concentrations and range of concentration of trace elements in unwashed and washed hair samples (ppm)

Element	Sample	No. of Sample	Concentration Range	Overall Average	± SD (16)	Proposed Baseline Concentration	Remark
Ag	U	41	0.007 - 0.528	0.088	0.108	0.062	omit 3 values
	W	40	0.006 - 0.414	0.056	0.071	0.047	omit 1 value
Al	U	50	2.613 - 230.544	18.592	30.885	14.267	" 1 "
	W	49	2.282 - 105.379	10.939	14.325	8.971	" 1 "
As	U	50	0.100 - 9.370	2.241	1.826	1.954	" 2 values
	W	50	0.095 - 8.402	1.591	1.539	1.362	" 2 "
Au	U	50	0.0014 - 0.1108	0.0161	0.0144	0.0147	" 3 "
	W	50	0.0009 - 0.0383	0.0083	0.008	0.0072	omit 1 value
Ba	U	49	0.546 - 54.794	9.609	10.296	7.773	omit 2 values
	W	49	0.304 - 36.664	7.206	6.948	6.593	" 2 "
Br	U	50	0.182 - 13.593	1.712	2.150	1.341	" 2 "
	W	50	0.089 - 6.726	0.977	1.346	0.739	" 2 "
Ca	U	50	138.64 - 2370.94	802.36	434.06	769.33	omit 1 value
	W	50	116.52 - 2293.03	668.65	464.48	605.31	omit 2 values
Ce	U	41	0.031 - 3.340	0.713	0.574	0.648	omit 1 value
	W	41	0.020 - 1.289	0.499	0.305	0.480	" 1 "
Cl	U	50	40.38 - 860.49	169.15	127.78	155.04	" 1 "
	W	50	12.28 - 379.88	47.78	51.60	41.01	" 1 "
Co	U	50	0.004 - 0.326	0.052	0.061	0.043	omit 2 values
	W	49	0.004 - 0.281	0.043	0.056	0.033	" 2 "

Table 4.5 (contd.)

Element	Sample	No. of Sample	Concentration Range	Overall \pm SD(16)		Proposed Baseline Concentration	Remark
Cr	U	46	0.024 - 0.862	0.278	0.217	0.266	omit 1 value
	W	40	0.016 - 0.737	0.180	0.175	0.150	omit 2 values
Cu	u	50	2.357 - 22.578	6.644	4.322	6.005	" 2 "
	W	50	0.770 - 15.350	4.094	2.719	3.626	" 2 "
Fe	u	50	3.062 - 45.020	17.808	11.450	17.808	
	W	50	2.469 - 44.536	13.839	10.581	12.459	omit 2 values
Hg	U	50	0.092 - 7.197	1.528	1.542	1.323	" 2 "
	W	50	0.044 - 4.658	1.156	1.134	1.000	" 2 "
I	U	50	0.154 - 28.317	1.322	4.041	0.771	omit 1 value
	W	49	0.154 - 1.981	0.382	0.325	0.326	omit 2 values
K	U	12	48.350 - 1510.17	500.94	427.53	409.19	omit 1 value
	W	9	42.350 - 979.82	327.83	297.24	246.33	" 1 "
La	U	43	0.004 - 0.446	0.054	0.070	0.044	" 1 "
	W	40	0.001 - 0.420	0.035	0.066	0.025	" 1 "
Mg	U	50	15.15 - 331.51	106.18	68.74	101.58	" 1 "
	W	50	9.29 - 215.68	85.69	52.35	85.69	
Mn	U	50	0.523 - 22.091	4.796	3.727	4.443	omit 1 value
	W	50	0.140 - 18.469	4.113	3.294	3.820	" 1 "
Na	U	50	104.70 - 2410.44	566.72	415.59	529.09	" 1 "
	W	49	13.00 - 1672.50	282.10	273.94	253.14	" 1 "

Table 4.5 (contd.)

Element	sample	No. of Sample	Concentration Range	Overall \pm SD(16) average		Proposed baseline Concentration	Remark
Rb	U	46	0.067 - 12.427	1.082	2.380	0.634	omit 2 values
	W	46	0.100 - 8.475	1.054	2.144	0.727	" 2 "
Sb	U	50	0.008 - 3.576	0.125	0.498	0.055	omit 1 value
	W	50	0.002 - 3.480	0.109	0.511	0.033	" 1 "
Se	U	50	0.160 - 91.760	3.647	12.982	1.848	" 1 "
	W	49	0.150 - 77.634	3.117	11.164	1.564	" 1 "
Sn	U	40	0.004 - 0.297	0.082	0.075	0.062	" 1 "
	W	40	0.002 - 0.168	0.052	0.043	0.049	" 1 "
Ti	U	50	1.344 - 17.747	7.400	3.816	7.188	" 1 "
	W	49	0.156 - 9.064	4.560	2.416	4.560	
V	U	50	0.016 - 0.770	0.155	0.129	0.143	omit 1 value
	W	49	0.004 - 0.411	0.110	0.084	0.104	omit 2 values
Zn	U	50	56.58 - 677.65	200.35	149.67	211.02	omit 1 value
	W	50	48.85 - 632.33	189.30	141.55	180.44	" 1 "
Sc	U	4	0.001 - 0.002	0.008	0.0004	-	
	W	2	0.001 - 0.002	0.0015	0.0005	-	
Hf	U	26	0.006 - 0.308	0.074	0.072	0.065	omit 1 value
	W	19	0.004 - 0.130	0.036	0.042	0.036	

U - unwashed sample

W - washed sample