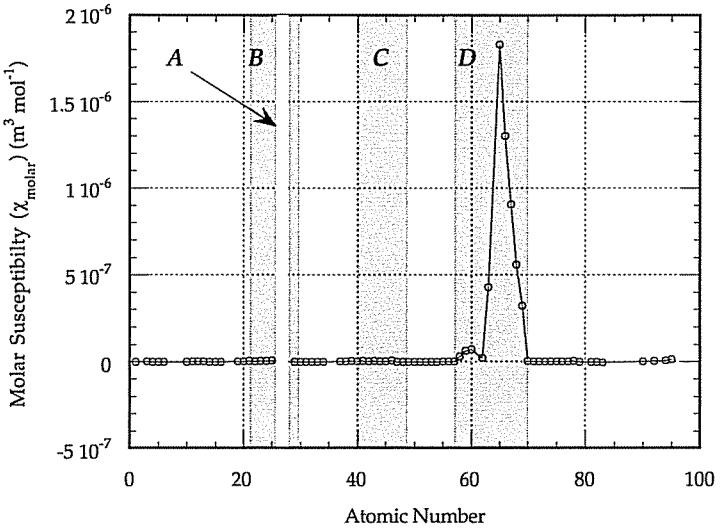
Table W2.1 Molar magnetic susceptibility of the elements at around room temperature. The data are summarised in Figure W2.3. The shading in the table corresponds to the shading in Figure and highlights elements with a large susceptibilities.

Z	Element, atomic mass (u) and density (kg m^{-3})			χ_M (m^3 mol^{-1})
1	Hydrogen, H	1.008	89	—
2	Helium, He	4.003	120	—
3	Lithium, Li	6.941	533	1.78×10^{-10}
4	Beryllium, Be	9.012	1846	-1.17×10^{-10}
5	Boron, B	10.81	2466	-8.43×10^{-11}
6	Carbon, C	12.01	2266	-7.57×10^{-11}
7	Nitrogen, N	14.01	1035	—
8	Oxygen, O	16	1460	—
9	Fluorine, F	19	1140	—
10	Neon, Ne	20.18	1442	-8.48×10^{-11}
11	Sodium, Na	22.99	966	2.02×10^{-10}
12	Magnesium, Mg	24.31	1738	1.65×10^{-10}
13	Aluminium, Al	26.98	2698	2.08×10^{-10}
14	Silicon, Si	28.09	2329	-5.06×10^{-11}
15	Phosphorus, P	30.97	1820	-3.41×10^{-10}
16	Sulphur, S	32.06	2086	-1.95×10^{-10}
17	Chlorine, Cl	35.45	2030	—
18	Argon, A	39.95	1656	—
19	Potassium, K	39.1	862	2.62×10^{-10}
20	Calcium, Ca	40.08	1530	5.61×10^{-10}
21	Scandium, Sc	44.96	2992	3.96×10^{-9}
22	Titanium, Ti	47.9	4508	1.92×10^{-9}
23	Vanadium, V	50.94	6090	3.20×10^{-9}
24	Chromium, Cr	52	7194	2.31×10^{-9}
25	Manganese, Mn	54.94	7473	6.59×10^{-9}
26	Iron, Fe	55.85	7873	Ferro
27	Cobalt, Co	58.93	8800	Ferro
28	Nickel, Ni	58.7	8907	Ferro
29	Copper, Cu	63.55	8933	-6.87×10^{-11}
30	Zinc, Zn	65.38	7135	-1.44×10^{-10}
31	Gallium, Ga	69.72	5905	-2.72×10^{-10}
32	Germanium, Ge	72.59	5323	-9.64×10^{-11}
33	Arsenic, As	74.92	5776	-6.87×10^{-11}
34	Selenium, Se	78.96	4808	-3.16×10^{-10}
35	Bromine, Br	79.9	3120	—
36	Krypton, Kr	83.8	3000	—
37	Rubidium, Rb	85.47	1533	2.13×10^{-10}
38	Strontium, Sr	87.62	2583	1.16×10^{-9}
39	Yttrium, Y	88.91	4475	2.40×10^{-9}
40	Zirconium, Zr	91.22	6507	1.53×10^{-9}
41	Niobium, Nb	92.91	8578	2.56×10^{-9}
42	Molybdenum, Mo	95.94	10222	1.15×10^{-9}
43	Technetium, Tc	97	11496	3.01×10^{-9}
44	Ruthenium, Ru	101.1	12360	5.43×10^{-10}
45	Rhodium, Rh	102.9	12420	1.40×10^{-9}
46	Palladium, Pd	106.4	11995	7.13×10^{-9}
47	Silver, Ag	107.9	10500	-2.45×10^{-10}
48	Cadmium, Cd	112.4	8647	-2.48×10^{-10}
49	Indium, In	114.8	7290	-8.04×10^{-10}
50	Tin, Sn	118.7	7285	-4.75×10^{-10}
51	Antimony, Sb	121.7	6692	-1.22×10^{-9}
52	Tellurium, Te	127.6	6247	-4.98×10^{-10}
53	Iodine, I	126.9	4953	-5.58×10^{-10}
54	Xenon, Xe	131.3	3560	-5.51×10^{-10}
55	Caesium, Cs	132.9	1900	3.72×10^{-10}
56	Barium, Ba	137.3	3594	2.61×10^{-10}
57	Lanthanum, La	138.9	6174	1.53×10^{-9}
58	Cerium, Ce	140.1	6711	3.04×10^{-8}
59	Praseodymium, Pr	140.9	6779	6.30×10^{-8}
60	Neodymium, Nd	144.2	7000	7.07×10^{-8}
61	Promethium, Pm	145	7220	—
62	Samarium, Sm	150.4	7536	2.29×10^{-8}
63	Europium, Eu	152	5248	4.27×10^{-7}
64	Gadolinium, Gd	157.2	7870	Ferro
65	Terbium, Tb	158.9	8267	1.83×10^{-6}
66	Dysprosium, Dy	162.5	8531	1.30×10^{-6}
67	Holmium, Ho	164.9	8797	9.05×10^{-7}
68	Erbium, Er	167.3	9044	5.57×10^{-7}
69	Thulium, Tm	168.9	9325	3.21×10^{-7}
70	Ytterbium, Yb	173	6966	3.13×10^{-9}
71	Lutetium, Lu	175	9842	2.28×10^{-10}
72	Hafnium, Hf	178.5	13276	9.46×10^{-10}
73	Tantalum, Ta	180.9	16670	1.94×10^{-9}
74	Tungsten, W	183.9	19254	7.36×10^{-10}
75	Rhenium, Re	186.2	21023	8.49×10^{-10}
76	Osmium, Os	190.2	22580	1.24×10^{-10}
77	Iridium, Ir	192.2	22550	3.21×10^{-10}
78	Platinum, Pt	195.1	21450	2.54×10^{-9}
79	Gold, Au	197	19281	-3.51×10^{-10}
80	Mercury, Hg	200.6	13546	—
81	Thallium, Tl	204.4	11871	-6.40×10^{-10}
82	Lead, Pb	207.2	11343	-2.88×10^{-10}
83	Bismuth, Bi	209	9803	-3.52×10^{-9}
84	Polonium, Po	209	9400	—
85	Astatine, At	210	—	—
86	Radon, Rn	222	4400	—
87	Francium, Fr	223	—	—
88	Radium, Ra	226	5000	—
89	Actinium, Ac	227	10060	—
90	Thorium, Th	232	11725	1.67×10^{-9}
91	Protactinium, Pa	231	15370	—
92	Uranium, U	238	19050	5.14×10^{-9}
93	Neptunium, Np	237	20250	—
94	Plutonium, Pu	244	19840	7.73×10^{-9}
95	Americium, Am	243	13670	1.22×10^{-8}

Figure W2.3 Summary of molar magnetic susceptibility data for the solid elements shown (a) at a large scale and (b) on a detailed scale. The bands *B*, *C* and *D* mark the first and second row of transition elements, and the lanthanide series. The band *A* marks the ferromagnetic elements Fe, Co and Ni. **Note:** points greater than zero correspond to a paramagnetic response and points less than zero correspond to a diamagnetic response.

(a)



(b)