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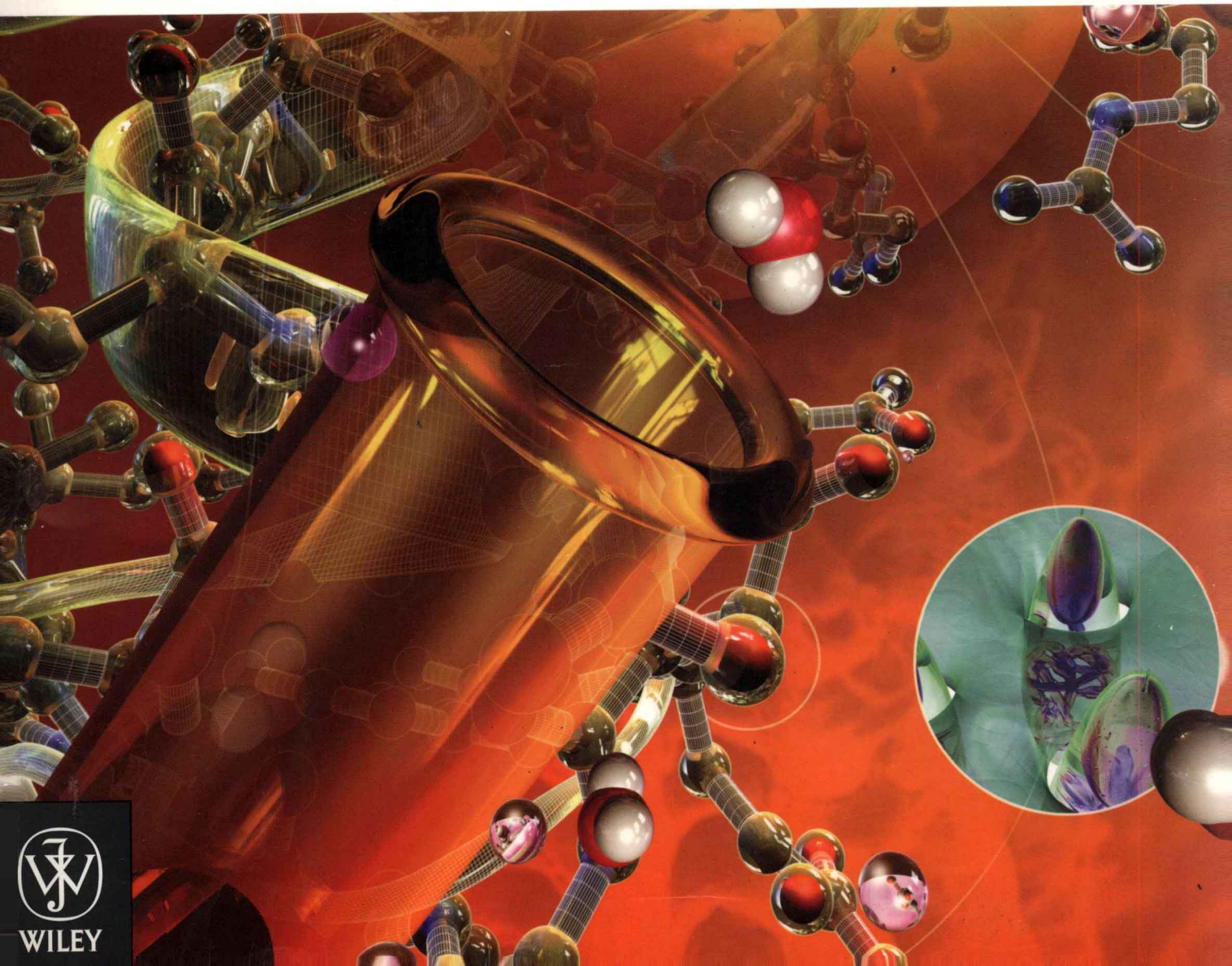

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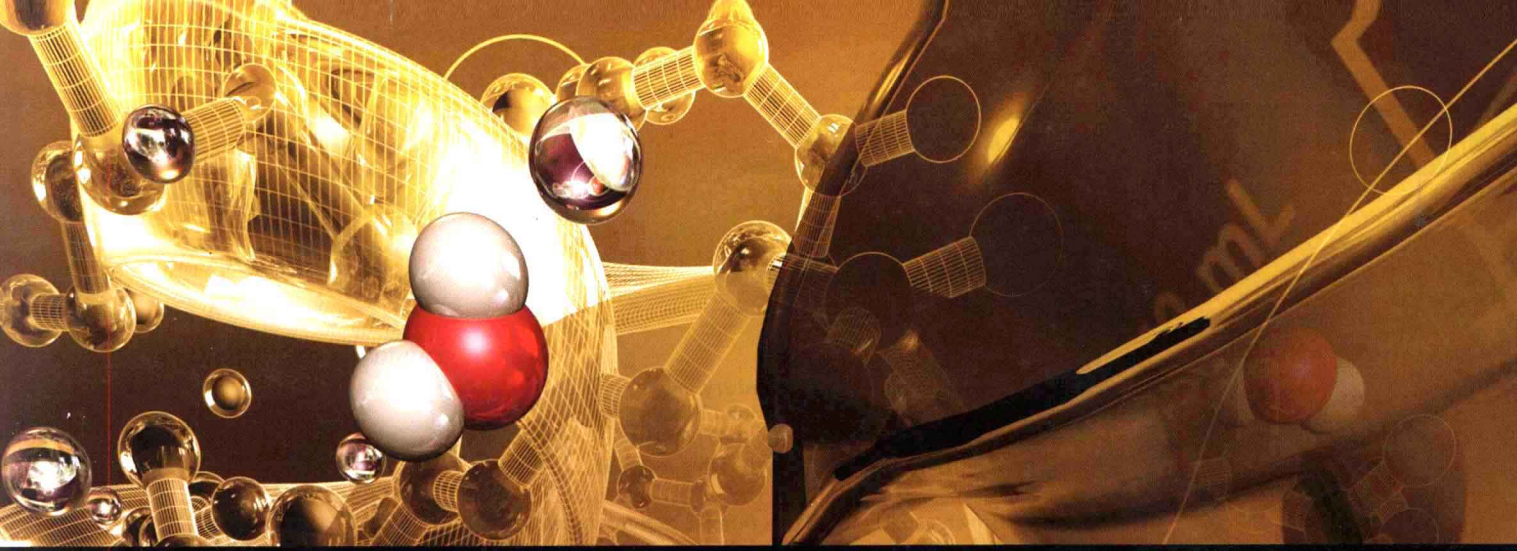

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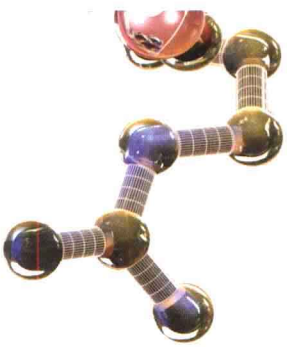

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University of Otago

STEVEN E BOTTLE
Queensland University of Technology

SIEGBERT SCHMID
University of Sydney

MAURO MOCERINO
Curtin University of Technology

UTA WILLE
University of Melbourne

JAMES E BRADY
St John's University

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Claremont McKenna College
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JOHN OLMSTED III
California State University

GREGORY M WILLIAMS
University of Oregon

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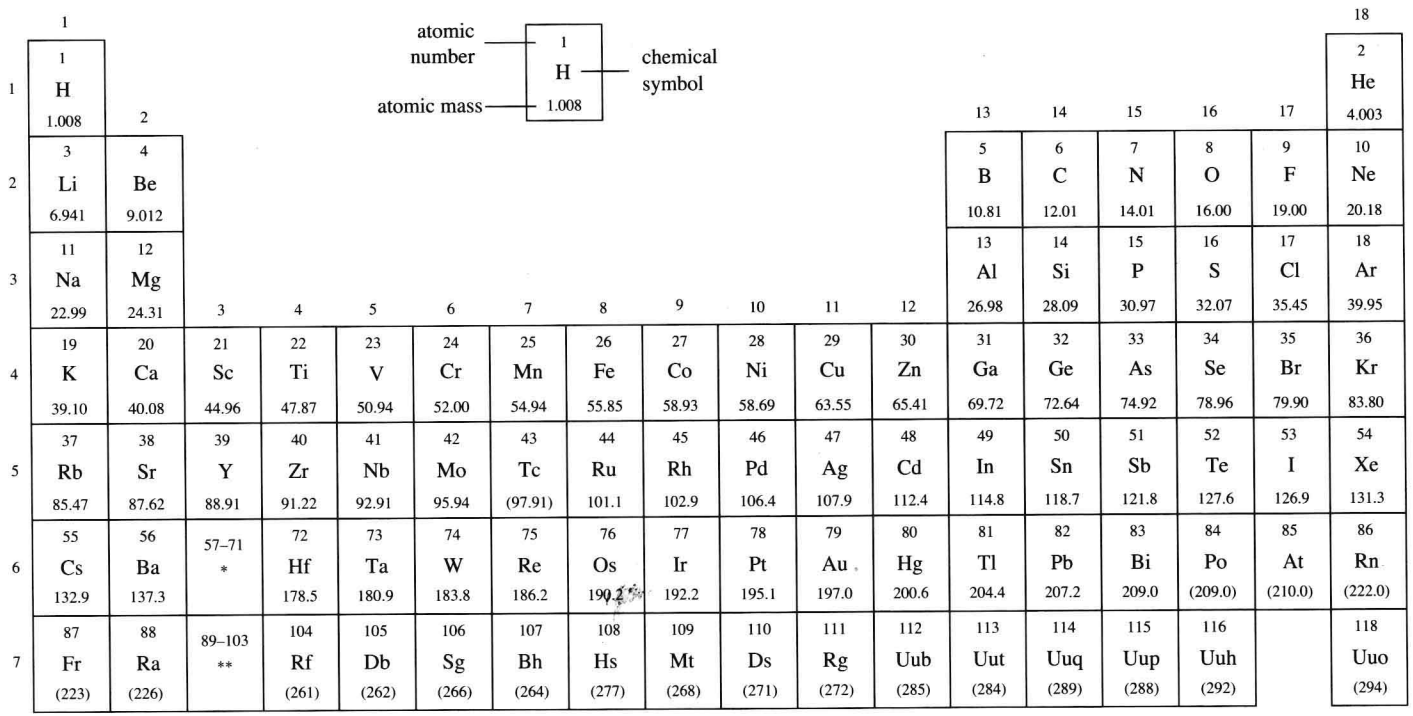
Periodic table of the elements



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H 1.008																	2 He 4.003
2	3 Li 6.941	4 Be 9.012											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
3	11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95
4	19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.87	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.41	31 Ga 69.72	32 Ge 72.64	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
5	37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (97.91)	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
6	55 Cs 132.9	56 Ba 137.3	57–71 *	72 Hf 178.5	73 Ta 180.9	74 W 183.8	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po (209.0)	85 At (210.0)	86 Rn (222.0)
7	87 Fr (223)	88 Ra (226)	89–103 **	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (264)	108 Hs (277)	109 Mt (268)	110 Ds (271)	111 Rg (272)	112 Uub (285)	113 Uut (284)	114 Uuq (289)	115 Uup (288)	116 Uuh (292)		118 Uuo (294)

*lanthanide series	57 La 138.9	58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm (145)	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0
**actinide series	89 Ac (227)	90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (262)

Name	Symbol	Atomic number	Atomic mass (g mol^{-1})[a]
actinium	Ac	89	227.0278[a]
aluminium	Al	13	26.981 5386(8)
americium	Am	95	241.0568[a]
antimony	Sb	51	121.760(1)
argon	Ar	18	39.948(1)
arsenic	As	33	74.921 60(2)
astatine	At	85	209.9871[a]
barium	Ba	56	137.327(7)
berkelium	Bk	97	247.0703[a]
beryllium	Be	4	9.012 182(3)
bismuth	Bi	83	208.980 40(1)
bohrium	Bh	107	272.1380[a]
boron	B	5	10.811(7)
bromine	Br	35	79.904(1)
cadmium	Cd	48	112.411(8)
caesium	Cs	55	132.905 4519(2)
calcium	Ca	20	40.078(4)
californium	Cf	98	251.0796[a]
carbon	C	6	12.0107(8)
cerium	Ce	58	140.116(1)
chlorine	Cl	17	35.453(2)
chromium	Cr	24	51.9961(6)
cobalt	Co	27	58.933 195(5)
copper	Cu	29	63.546(3)
curium	Cm	96	247.0704[a]
darmstadtium	Ds	110	281.162[a]
dubnium	Db	105	268.1255[a]
dysprosium	Dy	66	162.500(1)
einsteinium	Es	99	252.0830[a]
erbium	Er	68	167.259(3)
europium	Eu	63	151.964(1)
fermium	Fm	100	257.0951[a]
fluorine	F	9	18.998 4032(5)
francium	Fr	87	223.0197[a]
gadolinium	Gd	64	157.25(3)
gallium	Ga	31	69.723(1)
germanium	Ge	32	72.64(1)
gold	Au	79	196.966 569(4)
hafnium	Hf	72	178.49(2)
hassium	Hs	108	277.150[a]
helium	He	2	4.002 602(2)
holmium	Ho	67	164.930 32(2)
hydrogen	H	1	1.007 94(7)
indium	In	49	114.818(3)
iodine	I	53	126.904 47(3)
iridium	Ir	77	192.217(3)
iron	Fe	26	55.845(2)
krypton	Kr	36	83.798(2)
lanthanum	La	57	138.905 47(7)
lawrencium	Lr	103	262.1096[a]
lead	Pb	82	207.2(1)
lithium	Li	3	6.941(2)
lutetium	Lu	71	174.967(1)
magnesium	Mg	12	24.3050(6)
manganese	Mn	25	54.938 045(5)
meitnerium	Mt	109	276.1512[a]
mendelevium	Md	101	258.0984[a]
mercury	Hg	80	200.59(2)
molybdenum	Mo	42	95.94(2)
neodymium	Nd	60	144.242(3)
neon	Ne	10	20.1797(6)
neptunium	Np	93	237.0482[a]
nickel	Ni	28	58.6934(2)
niobium	Nb	41	92.906 38(2)
nitrogen	N	7	14.0067(2)
nobelium	No	102	259.1010[a]
osmium	Os	76	190.23(3)
oxygen	O	8	15.9994(3)
palladium	Pd	46	106.42(1)
phosphorus	P	15	30.973 762(2)
platinum	Pt	78	195.084(9)
plutonium	Pu	94	244.0642[a]
polonium	Po	84	208.9824[a]
potassium	K	19	39.0983(1)
praseodymium	Pr	59	140.907 65(2)
promethium	Pm	61	144.9127[a]
protactinium	Pa	91	231.035 88(2)[b]
radium	Ra	88	226.0254[a]
radon	Rn	86	222.0176[a]
roentgenium	Rg	111	280.1645[a]
rhenium	Re	75	186.207(1)
rhodium	Rh	45	102.905 50(2)
rubidium	Rb	37	85.4678(3)
ruthenium	Ru	44	101.07(2)
rutherfordium	Rf	104	267.1215[a]
samarium	Sm	62	150.36(2)
scandium	Sc	21	44.955 912(6)
seaborgium	Sg	106	271.1355[a]
selenium	Se	34	78.96(3)
silicon	Si	14	28.0855(3)
silver	Ag	47	107.8682(2)
sodium	Na	11	22.989 769 28(2)
strontium	Sr	38	87.62(1)
sulfur	S	16	32.065(5)
tantalum	Ta	73	180.947 88(2)
technetium	Tc	43	97.9072[a]
tellurium	Te	52	127.60(3)
terbium	Tb	65	158.925 35(2)
thallium	Tl	81	204.3833(2)
thorium	Th	90	232.038 06(2)[b]
thulium	Tm	69	168.934 21(2)
tin	Sn	50	118.710(7)
titanium	Ti	22	47.867(1)
tungsten	W	74	183.84(1)
ununbium[c]	Uub	112	285.174[a]
ununhexium[c]	Uuh	116	(d)
ununoctium[c]	Uuo	118	(d)
ununpentium[c]	Uup	115	288.192[a]
ununquadium[c]	Uuq	114	289.189[a]
ununtrium[c]	Uut	113	284.178[a]
uranium	U	92	238.028 91(3)[b]
vanadium	V	23	50.9415(1)
xenon	Xe	54	131.293(6)
ytterbium	Yb	70	173.04(3)
yttrium	Y	39	88.905 85(2)
zinc	Zn	30	65.409(4)
zirconium	Zr	40	91.224(2)

(a) All known significant digits are given. Parentheses indicate that the digit is uncertain.
(b) Element has no stable nuclides. The atomic mass of the longest lived isotope is given.
(c) Unnamed at July 2007
(d) Accurate atomic mass has not yet been determined.

Source: Weiser, ME, 'Atomic weights of the elements 2005' *Pure Appld. Chem.* vol. 78, no. 11, pp. 2051–66, © IUPAC 2006

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Chemistry is also supported by numerous engaging local examples designed to highlight the connections between chemistry and the world around you. A hallmark feature of the text is the showcasing of some inspirational local research work that relates to the chemical concepts taught in each chapter. These research profiles will help you to appreciate the positive contribution that chemistry has made and will continue to make to our lives. Our thanks goes out to the following researchers who provided information and/or materials for these profiles.

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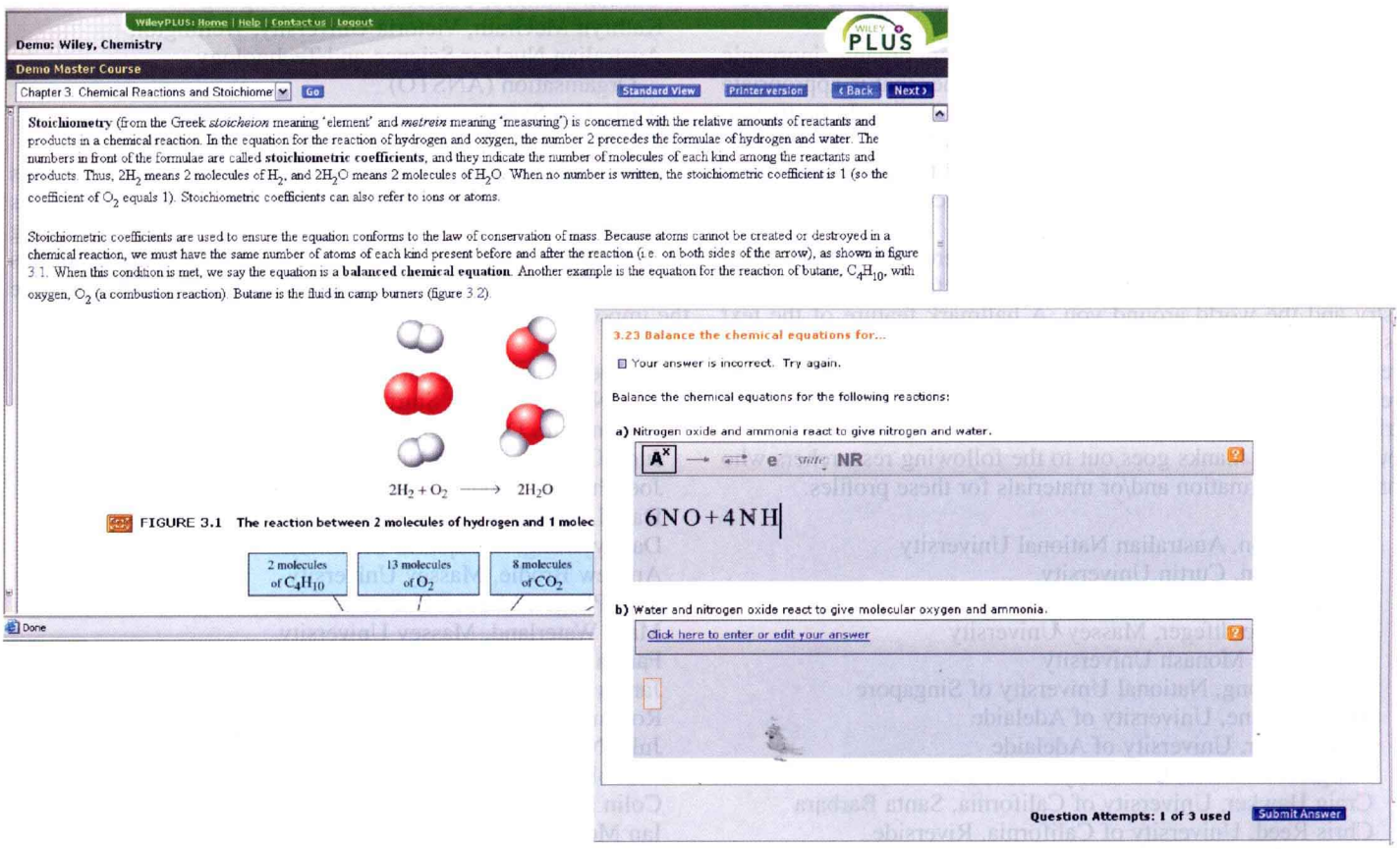

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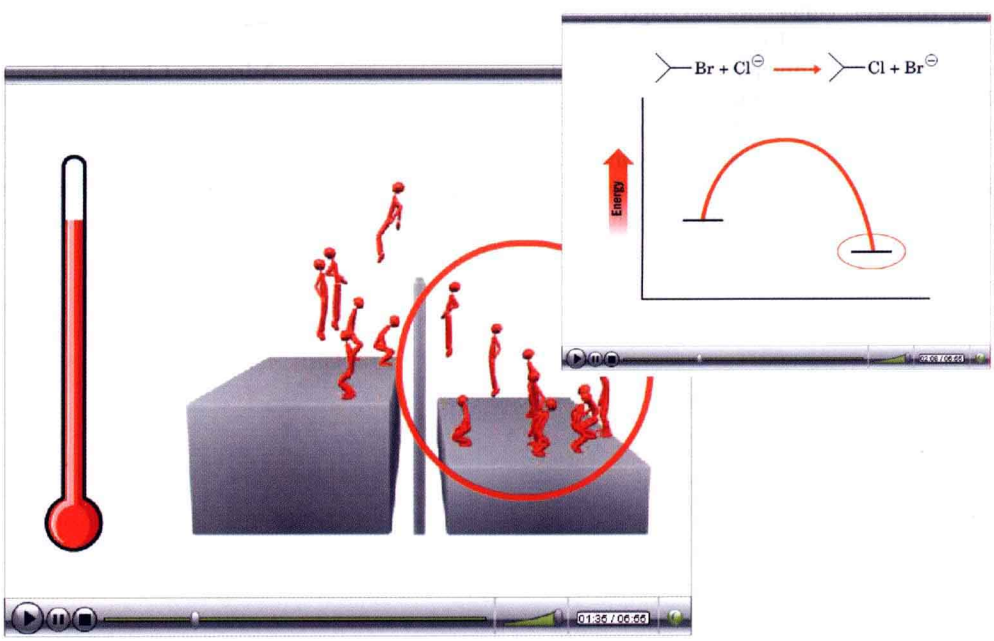

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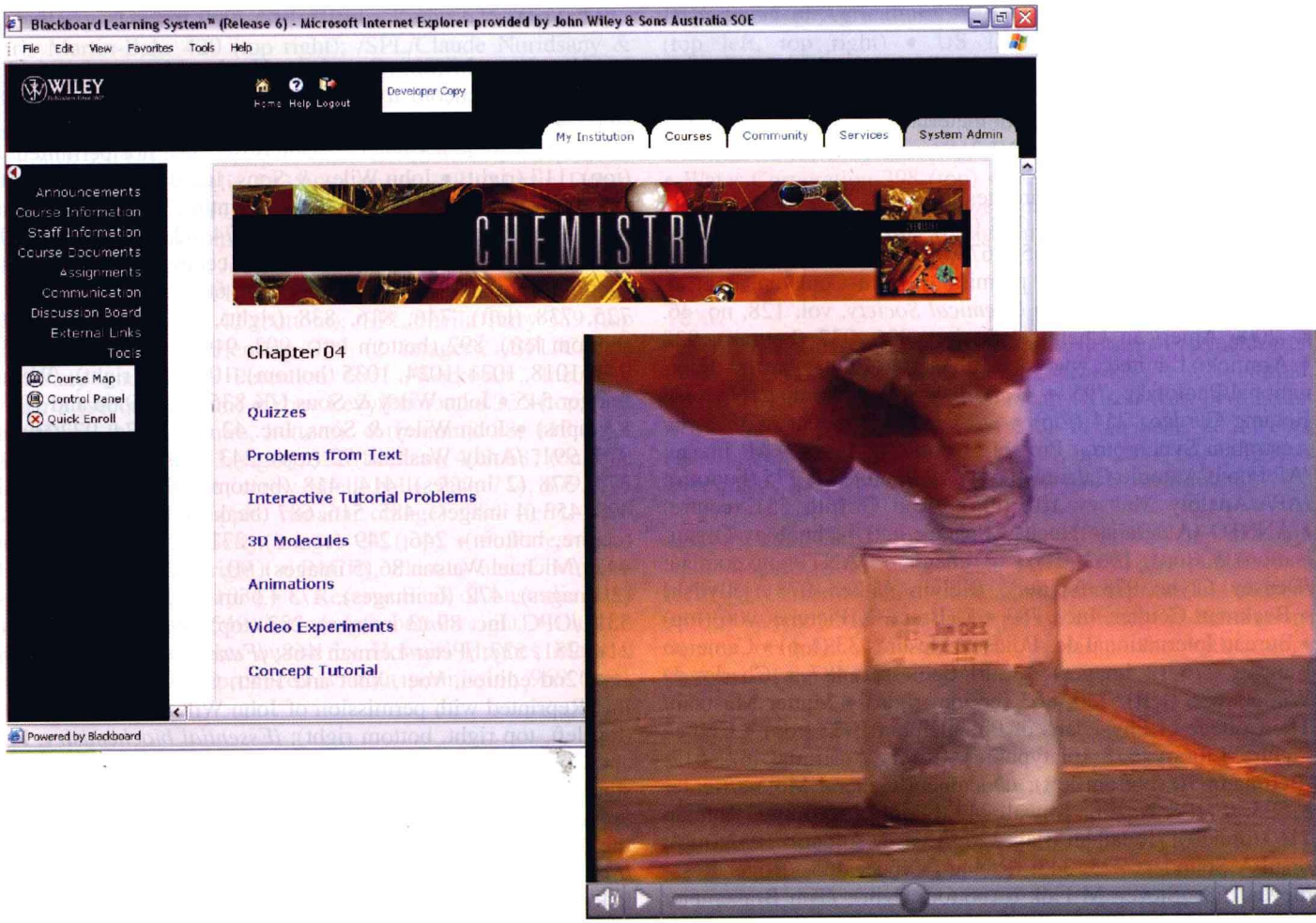

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