

KEY

CHAPTER 7 Review PACK

BLM 2-30
continued

BLM 2-43, Isotopes and Ions

1. Answers are in boldface.

Name of ion	Symbol	Number of Protons	Number of Electrons	Net charge
lithium ion	Li⁺	3	2	1+
potassium ion	K⁺	19	18	1+
magnesium ion	Mg²⁺	12	10	2+
chloride ion	Cl⁻	17	18	1-
fluoride ion	F⁻	9	10	1-
oxide ion	O²⁻	8	10	2-
iodide ion	I⁻	53	54	1-
scandium ion	Sc³⁺	21	18	3+
sulphide ion	S²⁻	16	18	2-
selenide ion	Se²⁻	34	36	2-
nitride ion	N³⁻	7	10	3-
aluminum ion	Al³⁺	13	10	3+
carbide ion	C⁴⁻	6	10	4-
calcium ion	Ca²⁺	20	18	2+
phosphide ion	P³⁻	15	18	3-

2. Answers are in boldface.

Name of Isotope	Symbol	Mass Number	Number of Protons	Number of Neutrons
hydrogen-3	³ ₁ H	3	1	2
scandium-49	⁴⁹ ₂₁ Sc	49	21	28
cobalt-60	⁶⁰ ₂₇ Co	60	27	33
nitrogen-15	¹⁵ ₇ N	15	7	8
uranium-238	²³⁸ ₉₂ U	238	92	146
iodine-129	¹²⁹ ₅₃ I	129	53	76
barium-135	¹³⁵ ₅₆ Ba	135	56	79
strontium-86	⁸⁶ ₃₈ Sr	86	38	48
oxygen-18	¹⁸ ₈ O	18	8	10
carbon-14	¹⁴ ₆ C	14	6	8

3. The oxygen isotopes have the same number of electrons and the same number of protons. The number of neutrons does not affect reactivity. How elements form compounds is dictated primarily by the valence electrons.

BLM 2-44, Isotopes

1. D
2. A
3. B
4. C
5. B
6. C

BLM 2-46, Half-Life and Radioisotope Dating

1. (a) Half-life is the time needed for half of a sample of a radioisotope to decay.
(b) 5730 years
(c) (i) 50% (ii) 25% (iii) 12.2%
(d) (i) 55% (ii) 30% (iii) 15%
(e) (i) 7500 years (ii) 13 000 years (iii) 26 000 years
(f) After 50 000 years there is insufficient parent isotope remaining to be able to detect it.
2. (a) Potassium-40 can exist hot molten rock, while argon-40, the daughter isotope, escapes from the molten rock because it is a gas.
(b) By radioactive decay of potassium-40
(c) 1.3 billion years (or 1300 million years)
(d) (i) 50 nanograms of potassium and 50 nanograms of argon-40
(ii) 25 nanograms of potassium and 75 nanograms of argon-40
(iii) 12.5 nanograms of potassium and 87.5 nanograms of argon-40
3. (a) ~~Lead-207 decays into~~ uranium-235 *(the PARENT) decays into Lead-207 (the daughter)*
(b) 710 million years (equivalent to one half-life)
(c) Estimated age is 5.68 billion years (Claire's analysis gave 5.55 billion years).
(d) (i) About 5 half-lives (ii) 3.125% remains
(e) Although the method cannot be used to date rocks older than 3 billion years, the method would still be able to demonstrate that the rocks were at least that age.
(f) Carbon-14 has a half-life in the hundreds of years and there would be no detectable amount present in the rocks, making carbon-14 dating unable to date the rock.

BLM 2-47, Chapter 7 Quiz

1. A
2. B
3. D
4. D
5. B
6. C
7. C
8. B
9. B
10. C
11. F
12. A
13. D
14. G
15. B