

A-Level Chemistry

Past-Paper Exercise Sheets — Question Index

73 subtopics • 235 questions • 1719 marks

1.1 Particles in the atom and atomic radius

4 questions, 13 marks • multiple choice x3, short answer

Source	Q	Type	Marks
9701/14 N25	1	multiple choice	1
9701/14 N25	2	multiple choice	1
9701/14 N25	3	multiple choice	1
9701/22 N25	1	short answer	10

1.2 Isotopes

2 questions, 30 marks • calculation, short answer

Source	Q	Type	Marks
9701/21 N25	1	calculation	20
9701/22 N25	1	short answer	10

1.3 Electrons, energy levels and atomic orbitals

5 questions, 14 marks • multiple choice x4, short answer

Source	Q	Type	Marks
9701/11 N25	1	multiple choice	1
9701/12 N25	1	multiple choice	1
9701/12 N25	4	multiple choice	1
9701/13 N25	1	multiple choice	1
9701/22 N25	1	short answer	10

1.4 Ionisation energy

4 questions, 4 marks • multiple choice x4

Source	Q	Type	Marks
9701/11 N25	2	multiple choice	1
9701/12 N25	2	multiple choice	1
9701/12 N25	7	multiple choice	1
9701/13 N25	2	multiple choice	1

2.1 Relative masses of atoms and molecules

3 questions, 22 marks • multiple choice x2, calculation

Source	Q	Type	Marks
9701/11 N25	40	multiple choice	1
9701/14 N25	40	multiple choice	1
9701/21 N25	1	calculation	20

2.3 Formulas

2 questions, 14 marks • multiple choice, short answer

Source	Q	Type	Marks
9701/11 N25	17	multiple choice	1
9701/21 N25	3	short answer	13

2.4 Reacting masses and volumes (of solutions and gases)

8 questions, 84 marks • calculation x3, short answer x3, multiple choice x2

Source	Q	Type	Marks
9701/11 N25	4	multiple choice	1
9701/14 N25	4	multiple choice	1
9701/31 N25	1	calculation	15
9701/31 N25	2	calculation	10
9701/34 N25	2	calculation	14
9701/51 N25	1	short answer	16
9701/52 N25	2	short answer	13
9701/34 J25	1	short answer	14

3.4 Covalent bonding and coordinate (dative covalent) bonding

2 questions, 2 marks • multiple choice x2

Source	Q	Type	Marks
9701/11 N25	6	multiple choice	1
9701/11 N25	24	multiple choice	1

3.5 Shapes of molecules

2 questions, 2 marks • multiple choice x2

Source	Q	Type	Marks
9701/12 N25	6	multiple choice	1
9701/14 N25	5	multiple choice	1

3.6 Intermolecular forces, electronegativity and bond properties

2 questions, 15 marks • multiple choice, short answer

Source	Q	Type	Marks
9701/14 N25	7	multiple choice	1
9701/22 N25	3	short answer	14

4.1 The gaseous state: ideal and real gases and $pV = nRT$

3 questions, 16 marks • multiple choice x2, calculation

Source	Q	Type	Marks
9701/11 N25	11	multiple choice	1
9701/12 N25	8	multiple choice	1
9701/51 N25	2	calculation	14

5.1 Enthalpy change, ΔH

7 questions, 27 marks • multiple choice x5, calculation x2

Source	Q	Type	Marks
9701/11 N25	7	multiple choice	1
9701/11 N25	8	multiple choice	1
9701/12 N25	9	multiple choice	1
9701/12 N25	10	multiple choice	1
9701/14 N25	10	multiple choice	1
9701/33 N25	2	calculation	11
9701/34 N25	1	calculation	11

5.2 Hess's law

3 questions, 26 marks • multiple choice, short answer, calculation

Source	Q	Type	Marks
9701/14 N25	9	multiple choice	1
9701/22 N25	3	short answer	14
9701/34 N25	1	calculation	11

6.1 Redox processes: electron transfer and changes in oxidation number (oxidation title_zh: state)

7 questions, 29 marks • multiple choice x5, short answer x2

Source	Q	Type	Marks
9701/11 N25	9	multiple choice	1
9701/11 N25	10	multiple choice	1
9701/12 N25	3	multiple choice	1
9701/12 N25	11	multiple choice	1
9701/14 N25	11	multiple choice	1
9701/22 N25	1	short answer	10
9701/34 J25	1	short answer	14

7.1 Chemical equilibria: reversible reactions, dynamic equilibrium

6 questions, 22 marks • multiple choice x5, short answer

Source	Q	Type	Marks
9701/11 N25	12	multiple choice	1
9701/12 N25	12	multiple choice	1
9701/12 N25	13	multiple choice	1
9701/14 N25	12	multiple choice	1
9701/14 N25	13	multiple choice	1
9701/52 N25	1	short answer	17

7.2 Brønsted-Lowry theory of acids and bases

2 questions, 2 marks • multiple choice x2

Source	Q	Type	Marks
9701/11 N25	13	multiple choice	1
9701/11 N25	14	multiple choice	1

8.1 Rate of reaction

2 questions, 16 marks • multiple choice, calculation

Source	Q	Type	Marks
9701/12 N25	14	multiple choice	1
9701/33 N25	1	calculation	15

8.2 Effect of temperature on reaction rates and the concept of activation energy

2 questions, 2 marks • multiple choice x2

Source	Q	Type	Marks
9701/12 N25	15	multiple choice	1
9701/14 N25	15	multiple choice	1

8.3 Homogeneous and heterogeneous catalysts

3 questions, 13 marks • multiple choice x2, short answer

Source	Q	Type	Marks
9701/11 N25	15	multiple choice	1
9701/14 N25	14	multiple choice	1
9701/24 N25	2	short answer	11

9.1 Periodicity of physical properties of the elements in Period 3

5 questions, 34 marks • multiple choice x3, calculation x2

Source	Q	Type	Marks
9701/11 N25	16	multiple choice	1
9701/12 N25	17	multiple choice	1
9701/14 N25	17	multiple choice	1
9701/21 N25	2	calculation	11
9701/22 N25	2	calculation	20

9.2 Periodicity of chemical properties of the elements in Period 3

7 questions, 46 marks • multiple choice x4, calculation x2, short answer

Source	Q	Type	Marks
9701/11 N25	18	multiple choice	1
9701/12 N25	18	multiple choice	1
9701/12 N25	23	multiple choice	1
9701/14 N25	16	multiple choice	1
9701/21 N25	2	calculation	11
9701/22 N25	2	calculation	20
9701/24 N25	2	short answer	11

9.3 Chemical periodicity of other elements

1 question, 20 marks • calculation

Source	Q	Type	Marks
9701/21 N25	1	calculation	20

10.1 Similarities and trends in the properties of the Group 2 metals, magnesium

8 questions, 28 marks • multiple choice x6, calculation x2

Source	Q	Type	Marks
9701/11 N25	19	multiple choice	1
9701/11 N25	20	multiple choice	1
9701/12 N25	19	multiple choice	1
9701/12 N25	20	multiple choice	1
9701/14 N25	19	multiple choice	1
9701/14 N25	20	multiple choice	1
9701/41 N25	1	calculation	15
9701/42 N25	1	calculation	7

11.1 Physical properties of the Group 17 elements

1 question, 22 marks • short answer

Source	Q	Type	Marks
9701/24 N25	1	short answer	22

11.2 The chemical properties of the halogen elements and the hydrogen halides

3 questions, 24 marks • multiple choice x2, short answer

Source	Q	Type	Marks
9701/11 N25	22	multiple choice	1
9701/11 N25	23	multiple choice	1
9701/24 N25	1	short answer	22

11.3 Some reactions of the halide ions

6 questions, 47 marks • multiple choice x3, calculation x2, short answer

Source	Q	Type	Marks
9701/11 N25	21	multiple choice	1
9701/12 N25	22	multiple choice	1
9701/14 N25	21	multiple choice	1
9701/31 N25	3	calculation	15
9701/34 N25	3	calculation	15
9701/34 J25	3	short answer	14

11.4 The reactions of chlorine

3 questions, 24 marks • multiple choice x2, short answer

Source	Q	Type	Marks
9701/12 N25	21	multiple choice	1
9701/14 N25	22	multiple choice	1
9701/24 N25	1	short answer	22

12.1 Nitrogen and sulfur

4 questions, 4 marks • multiple choice x4

Source	Q	Type	Marks
9701/12 N25	16	multiple choice	1
9701/12 N25	24	multiple choice	1
9701/14 N25	23	multiple choice	1
9701/14 N25	24	multiple choice	1

13.1 Formulas, functional groups and the naming of organic compounds

4 questions, 17 marks • multiple choice x3, short answer

Source	Q	Type	Marks
9701/11 N25	26	multiple choice	1
9701/14 N25	28	multiple choice	1
9701/14 N25	37	multiple choice	1
9701/22 N25	3	short answer	14

13.2 Characteristic organic reactions

2 questions, 25 marks • short answer, calculation

Source	Q	Type	Marks
9701/24 N25	3	short answer	11
9701/33 N25	3	calculation	14

13.3 Shapes of organic molecules; and bonds

3 questions, 3 marks • multiple choice x3

Source	Q	Type	Marks
9701/12 N25	5	multiple choice	1
9701/12 N25	25	multiple choice	1
9701/14 N25	6	multiple choice	1

13.4 Isomerism: structural isomerism and stereoisomerism

6 questions, 50 marks • multiple choice x3, short answer x2, calculation

Source	Q	Type	Marks
9701/11 N25	25	multiple choice	1
9701/12 N25	26	multiple choice	1
9701/14 N25	26	multiple choice	1
9701/21 N25	4	short answer	15
9701/22 N25	4	short answer	16
9701/24 N25	4	calculation	16

14.1 Alkanes

4 questions, 17 marks • multiple choice x3, short answer

Source	Q	Type	Marks
9701/11 N25	28	multiple choice	1
9701/11 N25	29	multiple choice	1
9701/14 N25	25	multiple choice	1
9701/22 N25	3	short answer	14

14.2 Alkenes

6 questions, 20 marks • multiple choice x5, short answer

Source	Q	Type	Marks
9701/11 N25	27	multiple choice	1
9701/12 N25	27	multiple choice	1
9701/12 N25	28	multiple choice	1
9701/12 N25	29	multiple choice	1
9701/14 N25	29	multiple choice	1
9701/21 N25	4	short answer	15

15.1 Halogenoalkanes

9 questions, 34 marks • multiple choice x7, short answer x2

Source	Q	Type	Marks
9701/11 N25	30	multiple choice	1
9701/11 N25	31	multiple choice	1
9701/12 N25	30	multiple choice	1
9701/12 N25	31	multiple choice	1
9701/14 N25	31	multiple choice	1
9701/14 N25	32	multiple choice	1
9701/14 N25	38	multiple choice	1
9701/22 N25	4	short answer	16
9701/24 N25	3	short answer	11

16.1 Alcohols

6 questions, 16 marks • multiple choice x5, short answer

Source	Q	Type	Marks
9701/11 N25	33	multiple choice	1
9701/11 N25	39	multiple choice	1
9701/12 N25	32	multiple choice	1
9701/12 N25	35	multiple choice	1
9701/14 N25	33	multiple choice	1
9701/24 N25	3	short answer	11

17.1 Aldehydes and ketones

6 questions, 16 marks • multiple choice x5, short answer

Source	Q	Type	Marks
9701/11 N25	36	multiple choice	1
9701/11 N25	38	multiple choice	1
9701/12 N25	34	multiple choice	1
9701/14 N25	34	multiple choice	1
9701/14 N25	35	multiple choice	1
9701/42 N25	7	short answer	11

18.1 Carboxylic acids

5 questions, 5 marks • multiple choice x5

Source	Q	Type	Marks
9701/11 N25	34	multiple choice	1
9701/11 N25	37	multiple choice	1
9701/12 N25	33	multiple choice	1
9701/12 N25	36	multiple choice	1
9701/12 N25	37	multiple choice	1

18.2 Esters

3 questions, 16 marks • multiple choice x2, calculation

Source	Q	Type	Marks
9701/11 N25	35	multiple choice	1
9701/14 N25	36	multiple choice	1
9701/33 N25	3	calculation	14

20.1 Addition polymerisation

3 questions, 3 marks • multiple choice x3

Source	Q	Type	Marks
9701/11 N25	32	multiple choice	1
9701/12 N25	39	multiple choice	1
9701/14 N25	39	multiple choice	1

22.1 Infrared spectroscopy

2 questions, 17 marks • multiple choice, short answer

Source	Q	Type	Marks
9701/12 N25	40	multiple choice	1
9701/22 N25	4	short answer	16

22.2 Mass spectrometry

2 questions, 31 marks • short answer x2

Source	Q	Type	Marks
9701/21 N25	4	short answer	15
9701/22 N25	4	short answer	16

23.1 Lattice energy and Born-Haber cycles

2 questions, 24 marks • short answer, calculation

Source	Q	Type	Marks
9701/42 N25	4	short answer	6
9701/44 N25	2	calculation	18

23.2 Enthalpies of solution and hydration

3 questions, 40 marks • calculation x3

Source	Q	Type	Marks
9701/41 N25	1	calculation	15
9701/42 N25	1	calculation	7
9701/44 N25	2	calculation	18

23.3 Entropy change, ΔS

1 question, 9 marks • short answer

Source	Q	Type	Marks
9701/44 N25	3	short answer	9

23.4 Gibbs free energy change, ΔG

1 question, 9 marks • short answer

Source	Q	Type	Marks
9701/44 N25	3	short answer	9

24.1 Electrolysis

1 question, 15 marks • calculation

Source	Q	Type	Marks
9701/42 N25	5	calculation	15

24.2 Standard electrode potentials E° , standard cell potentials E_{cell} and the

3 questions, 34 marks • calculation x3

Source	Q	Type	Marks
9701/41 N25	4	calculation	11
9701/41 N25	2	calculation	8
9701/42 N25	5	calculation	15

25.1 Acids and bases

2 questions, 31 marks • calculation, short answer

Source	Q	Type	Marks
9701/42 N25	3	calculation	15
9701/51 N25	1	short answer	16

26.1 Simple rate equations, orders of reaction and rate constants

4 questions, 46 marks • calculation x4

Source	Q	Type	Marks
9701/41 N25	3	calculation	11
9701/42 N25	2	calculation	9
9701/44 N25	4	calculation	12
9701/54 N25	2	calculation	14

26.2 Homogeneous and heterogeneous catalysts

3 questions, 32 marks • calculation x3

Source	Q	Type	Marks
9701/41 N25	3	calculation	11
9701/42 N25	2	calculation	9
9701/44 N25	4	calculation	12

28.1 General physical and chemical properties of the first row of transition

6 questions, 78 marks • calculation x4, short answer x2

Source	Q	Type	Marks
9701/31 N25	3	calculation	15
9701/41 N25	2	calculation	8
9701/41 N25	5	short answer	14
9701/42 N25	5	calculation	15
9701/42 N25	6	short answer	7
9701/44 N25	1	calculation	19

28.2 General characteristic chemical properties of the first set of transition

6 questions, 92 marks • calculation x5, short answer

Source	Q	Type	Marks
9701/31 N25	3	calculation	15
9701/33 N25	3	calculation	14
9701/34 N25	3	calculation	15
9701/41 N25	5	short answer	14
9701/42 N25	5	calculation	15
9701/44 N25	1	calculation	19

28.3 Colour of complexes

3 questions, 48 marks • calculation x2, short answer

Source	Q	Type	Marks
9701/41 N25	5	short answer	14
9701/42 N25	5	calculation	15
9701/44 N25	1	calculation	19

28.4 Stereoisomerism in transition element complexes

3 questions, 40 marks • short answer x2, calculation

Source	Q	Type	Marks
9701/41 N25	5	short answer	14
9701/42 N25	6	short answer	7
9701/44 N25	1	calculation	19

28.5 Stability constants, Kstab

2 questions, 26 marks • short answer, calculation

Source	Q	Type	Marks
9701/42 N25	6	short answer	7
9701/44 N25	1	calculation	19

29.1 Formulas, functional groups and the naming of organic compounds

1 question, 11 marks • calculation

Source	Q	Type	Marks
9701/44 N25	8	calculation	11

29.2 Characteristic organic reactions

1 question, 11 marks • calculation

Source	Q	Type	Marks
9701/44 N25	8	calculation	11

29.3 Shapes of aromatic organic molecules; and bonds

3 questions, 36 marks • calculation x2, short answer

Source	Q	Type	Marks
9701/42 N25	9	short answer	14
9701/44 N25	5	calculation	13
9701/44 N25	6	calculation	9

29.4 Isomerism: optical

2 questions, 27 marks • short answer, calculation

Source	Q	Type	Marks
9701/42 N25	8	short answer	16
9701/44 N25	8	calculation	11

30.1 Arenes

3 questions, 40 marks • calculation x2, short answer

Source	Q	Type	Marks
9701/41 N25	8	calculation	13
9701/42 N25	9	short answer	14
9701/44 N25	5	calculation	13

31.1 Halogen compounds

2 questions, 24 marks • calculation x2

Source	Q	Type	Marks
9701/41 N25	8	calculation	13
9701/44 N25	8	calculation	11

32.2 Phenol

1 question, 9 marks • short answer

Source	Q	Type	Marks
9701/44 N25	7	short answer	9

33.1 Carboxylic acids

2 questions, 21 marks • calculation x2

Source	Q	Type	Marks
9701/41 N25	7	calculation	12
9701/44 N25	6	calculation	9

33.2 Esters

1 question, 9 marks • short answer

Source	Q	Type	Marks
9701/44 N25	7	short answer	9

33.3 Acyl chlorides

2 questions, 29 marks • calculation, short answer

Source	Q	Type	Marks
9701/41 N25	8	calculation	13
9701/42 N25	8	short answer	16

34.1 Primary and secondary amines

1 question, 9 marks • calculation

Source	Q	Type	Marks
9701/41 N25	9	calculation	9

34.2 Phenylamine and azo compounds

2 questions, 26 marks • calculation, short answer

Source	Q	Type	Marks
9701/41 N25	7	calculation	12
9701/42 N25	9	short answer	14

34.3 Amides

2 questions, 21 marks • calculation x2

Source	Q	Type	Marks
9701/41 N25	9	calculation	9
9701/41 N25	7	calculation	12

34.4 Amino acids

1 question, 16 marks • short answer

Source	Q	Type	Marks
9701/42 N25	8	short answer	16

35.1 Condensation polymerisation

1 question, 16 marks • short answer

Source	Q	Type	Marks
9701/42 N25	8	short answer	16

37.2 Gas/liquid chromatography

1 question, 7 marks • short answer

Source	Q	Type	Marks
9701/41 N25	6	short answer	7

37.4 Proton (¹H) NMR spectroscopy

1 question, 11 marks • short answer

Source	Q	Type	Marks
9701/42 N25	7	short answer	11