

Revision

Pearson Edexcel · International GCSE · Chemistry

Original open focus revision; complete specification coverage remains unfinished.

1 Particles, bonding and bulk properties

- ionic bond
- delocalized electron

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Why does molten sodium chloride conduct?

- Its ions can move
- Its atoms become electrons
- Its molecules contain no charge

Available marks: 2.

Worked answer

Its ions can move

- To explain a bulk property, name the structure, particles, forces and mobile charge carriers. Simple molecular substances can have strong covalent bonds inside molecules but weak attractions between molecules.

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An atom has atomic number 17 and mass number 35. Find its number of neutrons.

Available marks: 4.

Worked answer

18

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Melting a simple molecular substance usually overcomes intermolecular attractions; it does not require breaking all covalent bonds within each molecule.

2 Amounts, equations and limiting reagents

- mole
- limiting reagent

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Which step comes first in a reacting-mass calculation?

- Compare masses without an equation
- Use a balanced equation and convert mass to amount
- Assume every mole ratio is 1:1

Available marks: 2.

Worked answer

Use a balanced equation and convert mass to amount

- Calculate the amount available for each reactant and divide by its coefficient. The smaller ratio limits the reaction. Use that reactant to calculate the maximum product before comparing actual yield.

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Calculate amount in 5.0 g of a substance with molar mass 100 g per mole.

Available marks: 4.

Worked answer

0.05 mol

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Excess acid means acid does not limit the stated calculation. A coefficient of 2 before HCl does not double the hydrogen amount.

3 Redox and electrolysis

- oxidation
- reduction

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What happens to Cu^{2+} at the cathode?

- It gains electrons
- It loses two protons
- It gains neutrons

Available marks: 2.

Worked answer

It gains electrons

- Predict products using the specified electrolyte and electrode material. In an aqueous solution, hydrogen or oxygen may form because water-related species compete. Molten salts contain only the ions of the salt.

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How many moles of electrons reduce 0.20 mol of Cu^{2+} to copper?

Available marks: 4.

Worked answer

0.4 mol

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Electrode signs depend on the cell type. In an electrolytic cell the cathode is negative; reduction remains the defining process at a cathode in every cell.

4 Chemical tests and analytical confidence

- chromatography
- R_f

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Why use pencil for a chromatography baseline?

- Graphite is less likely to dissolve and move with the solvent
- Pencil automatically identifies ions
- Ink is always invisible

Available marks: 2.

Worked answer

Graphite is less likely to dissolve and move with the solvent

- Rf is distance travelled by a component divided by distance travelled by the solvent front, both measured from the baseline. Compare under the same conditions; an Rf value alone does not establish identity across different solvents.

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A spot travels 4.2 cm while the solvent front travels 7.0 cm. Find Rf.

Available marks: 4.

Worked answer

0.6

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

A single spot can conceal substances that co-elute. Ink on the baseline can dissolve and create extra spots.

5 Calorimetry and chemical energy

- exothermic
- enthalpy change

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Which process requires energy?

- Breaking a covalent bond
- Forming every chemical bond
- Cooling a hot solution

Available marks: 2.

Worked answer

Breaking a covalent bond

- Calculate energy transferred from the mass, specific heat capacity and temperature rise when these are given. At GCSE, use reaction profiles and bond-energy

differences where your tier specifies them; this lesson does not introduce advanced molar enthalpy calculations.

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50 g water rises 4 °C. Use $c = 4.2$ J per gram per degree to find q .

Available marks: 4.

Worked answer

840 J

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Heat loss usually lowers the observed temperature rise. The solution gaining heat and the reaction losing heat have opposite signs.

6 Rates, catalysts and reliable endpoints

- activation energy
- rate

edexcel igcse chemistry · rates · open · 1

Two reactions reach the same final gas volume. Which can still differ?

- Their rates
- The balanced equation must be different
- The product must have different molar mass

Available marks: 2.

Worked answer

Their rates

- A product-time graph has a steeper gradient where rate is larger. A tangent estimates instantaneous rate; a secant gives average rate over an interval. The final plateau reflects the total collected product under the stated conditions.

A reaction makes 24 cubic centimetres of gas in 40 s. Find average rate.

Available marks: 4.

Worked answer

$0.6 \text{ cm}^3/\text{s}$

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

A catalyst does not change the equilibrium constant at a fixed temperature. A mass-loss method cannot detect all reactions, and losing gas through a leak biases a collection experiment.

7 Equilibrium and changing conditions

- equilibrium
- reversible reaction

What is equal at dynamic equilibrium?

- Concentrations of all species
- Forward and reverse reaction rates
- Masses of every reactant and product

Available marks: 2.

Worked answer

Forward and reverse reaction rates

- Changing conditions can change the equilibrium composition. A catalyst speeds both directions and shortens the time to equilibrium; it does not change the final equilibrium composition at a fixed temperature.

In one second there are 12 forward events and 12 reverse events. Find the net product-count change.

Available marks: 4.

Worked answer

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Do not use a catalyst to claim a larger equilibrium yield. For heterogeneous equilibria, pure solids are omitted from the usual equilibrium expression.

8 Organic structures and reaction pathways

- functional group
- isomer

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What happens to the carbon skeleton when bromine adds to ethene?

- It remains two carbons long
- It becomes one carbon long
- It becomes a six-carbon ring

Available marks: 2.

Worked answer

It remains two carbons long

- Distinguish addition, substitution, oxidation and polymerization by tracing bonds before and after reaction. Conditions and reagents belong to the reaction arrow; they are not interchangeable labels.

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How many moles of bromine react completely with 0.15 mol ethene?

Available marks: 4.

Worked answer

0.15 mol

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Bromine decolourization provides evidence of unsaturation in an appropriate test. It is not proof that an unknown sample is specifically ethene.