



Answer keys:

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MCQ

09-1-M-01	A
09-1-M-02	B
09-1-M-03	A
09-1-M-04	A
09-1-M-05	C

Questions

09-1-Q-01

- good conductor of electricity
- sacrificial protection/zinc is more reactive than iron
- Bronze is a stronger metal than copper due to the irregular arrangement of its atoms

09-1-Q-02

- ions are in fixed positions/mobile electrons carry electric current
- in steel, carbon atoms prevent sliding

09-1-Q-03

Task 1

- Statement of the problem
Does alloying increase hardness of metals?
- All the variables
Manipulated variables: Copper and brass
Responding variables: The size of the dent made by the steel ball bearing on the block.

Constant variable:
Height of weight and mass of weight

- Apparatus: 1kg weight, cellophane tape, retort stand and clamp, ruler, steel ball bearing and thread
Substances: Brass block and copper block

(iv) Procedure:

- Ball bearing is attached to the surface of the metal block using cellophane tape.
- 1kg weight is held 50 cm from the surface of copper block using thread.
- Weight is released to hit steel ball.
- Diameter of dent formed on surface of copper block is measured.
- Steps 1 to 4 are repeated twice on the other parts of the copper block
- Experiment is repeated with the same steel ball bearing on brass block.

Task 2

- Statement of the problem:
Does increasing the concentration of acid increase the rate of reaction?
- Manipulated variable: Concentration of hydrochloric acid
Responding variable: Rate of reaction
Constant variable: Mass of metal and volume of acid

- Apparatus: Conical flask, delivering tube, electronic balance, measuring cylinder, retort stand and stop watch.

Substances:

Hydrochloric acid (1 mol dm⁻³) and zinc powder

(iv) Procedure:

- 25 cm³ of 1 mol dm⁻³ HCl is poured into conical flask. Initial burette reading is recorded.
- 5 g of zinc powder is added into conical flask
- Stopwatch is started immediately and the mixture in the conical flask is shaken.
- Time used to collect 5 cm³ gas is recorded.
- The experiment is repeated using HCl of same volume but different molarity.

09-2-M-09	D
09-2-M-10	A
09-2-M-11	C
09-2-M-12	D
09-2-M-13	A
09-2-M-14	D
09-2-M-15	D
09-2-M-16	B
09-2-M-17	A
09-2-M-18	A
09-2-M-19	D
09-2-M-20	A
09-2-M-21	A
09-2-M-22	C
09-2-M-23	C
09-2-M-24	C
09-2-M-25	B
09-2-M-26	B
09-2-M-27	A
09-2-M-28	C
09-2-M-29	D
09-2-M-30	A
09-2-M-31	B
09-2-M-32	C
09-2-M-33	B
09-2-M-34	C

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MCQ

09-2-M-01	C
09-2-M-02	B
09-2-M-03	C
09-2-M-04	C
09-2-M-05	D
09-2-M-06	B
09-2-M-07	B
09-2-M-08	B

Questions

09-2-Q-01

- P is more reactive than Q. more exothermic
- (i) reaction between P and copper(II) sulfate is more exothermic
(ii) 0.413 mol/dm³
- $\frac{p}{0.025 \text{ dm}^3}$