IB Chemistry SL Practice Test - Answer Key

S1.1 and S1.2 - Revised Version

Paper 1A

1. B

2. B

3. B

4. C

5. C

6. A

7. C

8. B

9. A

10. C

Paper 1B

1(a) Add magnesium carbonate to dilute sulfuric acid and stir. Bubbles/effervescence of CO2 are observed.

1(b) Add excess solid so that all sulfuric acid is used up; excess solid remains once the acid is fully reacted.

1(c) Filter to remove excess unreacted magnesium carbonate from the magnesium sulfate solution.

1(d) Gently heat the filtrate to concentrate it, allow it to cool so crystals form, then filter and dry the crystals.

2(a) Salt A. Its solubility changes much more with temperature, so a hot saturated solution can deposit more crystals on cooling.

2(b) At 70 °C about 94 g dissolves per 100 g water; at 20 °C about 28 g remains dissolved. Crystals ≈ 94 - 28 = 66 g.

2(c) Cold water dissolves less product, so less crystal is lost during washing.

3(a) Use a magnet to remove iron; add water to dissolve NaCl; filter to separate sand; wash and dry sand; evaporate/crystallize the filtrate to recover NaCl.

3(b) Iron = 2.17/5.62 × 100 = 38.6%; Sand = 1.98/5.62 × 100 = 35.2%.

3(c) Example: sand/salt/sample still wet when weighed; dry/heat to constant mass. Another valid route is oxidation of iron and reducing its exposure to air/water.

3(d) Visual quantity/volume is not a reliable measure of mass; iron is denser, so a smaller-looking quantity can have more mass.

3(e) Fractional distillation; boiling point.

Paper 2

1(a) Negative.

1(b) Opposite charges attract, so the negatively charged electrons are attracted toward the positive plate.

1(c) The proton beam would bend toward the negative plate. It would be deflected much less because a proton has a much greater mass than an electron, so the same electric force produces a much smaller change in its motion.

1(d) Electrons are particles smaller than atoms and are contained within atoms, so atoms must have internal structure and are not indivisible.

2(a) Gas particles are far apart with large empty spaces between them, so they can be pushed closer together.

2(b) They move faster on average; their average kinetic energy increases.

2(c) Liquid particles are already close together with very little empty space, so they cannot be pushed much closer together.

3(a) 79Br: neutrons = 44. 81Br−: protons = 35, electrons = 36. 79Br+: neutrons = 44.

3(b) Similarity: same chemical properties/very similar chemical behavior because they have the same electron arrangement. Difference: physical properties such as mass-related properties can differ.

3(c) They contain different numbers of neutrons.