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IBMYP Chemistry Sample Paper 3

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Group 5: Sciences
On Screen Examination

TOTAL MARKS: 100

Instructions

- The on-screen examination has not yet started.
- Your time will begin once you have clicked the Start button below. Do not click Start until instructed to do so.
- Before the examination begins you are given 5 minutes to become familiar with its structure. Please navigate around the examination, taking note of the length of each task and question. You have 2 hours to complete the examination.
- There are 10 separate questions in this examination. Each question may have sub-parts. Answer all the questions in the response boxes provided. The maximum mark for this examination is 100 marks.
- As you progress through the questions, your answers are automatically saved.
- When 2 hours has ended. you will no longer be able to answer any questions.

Question 1: 8 marks

Q.1) In some regions of the world, farmers face challenges in growing certain crops due to poor soil conditions. To improve soil fertility, they often use fertilisers that provide essential nutrients to plants. One common type of fertiliser is ammonium nitrate (NH4NO3). When ammonium nitrate dissolves in water, it dissociates into ammonium ions (NH4+) and nitrate ions (NO3-). These ions are then available for plant uptake. The dissolution of ammonium nitrate in water is an endothermic process.

https://www.newindianexpress.com/nation/2022/aug/07/discounts-drive-up-indias-fertiliser-imports-from-russia-in-current-fiscal-2485125.html

Q.1) a) choose the image that appropriately describes an endothermic process? (1 mark)

a.) 

b.) 

c.) 

d.) 

Answer: D. the ice melting.

Q.1) b) The balanced chemical equation for the dissolution of ammonium nitrate in water is: NH4NO3 (s) + H2O (l) → NH4+ (aq) + NO3- (aq)
If a farmer needs to use 15.0 grams of ammonium nitrate to fertilise a specific area of land, calculate: How many moles of ammonium nitrate (NH4NO3) are used for fertilisation? (3 marks)

Answer: *To calculate the number of moles of ammonium nitrate used for fertilisation, we need to use the molar mass of NH4NO3.*

Molar mass of NH4NO3 = (1 × molar mass of N) + (4 × molar mass of H) + (3 × molar mass of O)
= (1 × 14.01 g/mol) + (4 × 1.01 g/mol) + (3 × 16.00 g/mol)
= 80.05 g/mol

Number of moles of NH4NO3 = Mass of NH4NO3 / Molar mass of NH4NO3
= 15.0 g / 80.05 g/mol
≈ 0.1873 moles

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