

(NPK fertilisers (industrial production, comparison with natural sources))

Q1. (2019)

world population has increased

any **one** from:

- demand for fertiliser has increased
- increased demand for other specified ammonia-based products e.g. nitric acid, drugs, dyes, explosives

Q2. (2021)

ammonium phosphate

potassium nitrate

Q3. (2021)

(nitric acid) calcium nitrate

(phosphoric acid)

(calcium) triple superphosphate

or

calcium dihydrogenphosphate

Q4. (2021)

(industrial process)

(is) large(er) scale

(is) quicker

(is a) continuous process

reasoned judgement

Q5. a). (2023)

reasons

- compound **A** (potassium chloride) only contains potassium
- compound **A** (potassium chloride) is the only source of potassium so is needed.
- compound **B** (ammonium nitrate) only contains nitrogen
- compound **B** (ammonium nitrate) contains more nitrogen than compound **C** (diammonium hydrogen phosphate) so is preferable
- compound **B** (ammonium nitrate) contains more nitrogen and is cheaper than compound **C** (diammonium hydrogen phosphate) and so is more cost effective
- compound **C** (diammonium hydrogen phosphate) contains phosphorus which is not needed

judgement

- none of the compounds contain both nitrogen and potassium so a mixture is needed
- (both) compound **A** (potassium chloride) and **B** (ammonium nitrate) should be used
- (both) compound **A** (potassium chloride) and **C** (diammonium phosphate) could be used

Q5. b). (2023)
mining

Q5. c). (2023)
potassium sulfate

Q5. d). (2023)
ammonia

Q6. (2023)
(phosphate rock is) insoluble (in water)

Q7. (2023)

Using Resources

<http://www.pcfgstudy.com>

(sulfuric acid)
calcium sulfate

(phosphoric acid)
calcium phosphate

Q8. (2024)

fertilisers