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Q45

Consider the following substances: I. Ethanol II. Nitroglycerine III. Urea Coal gasification technology can be used in the production of how many of them? (a) Only one (b) Only two (c) All the three (d) None Official key: B.

UPSC Civil Services Prelims 2025 · General Studies · 2 marks · Environment and Ecology

Environment, ecology, climate, biodiversity - Prelims GS Paper I.

Explanation

(a)

Only one. **Syngas** routes feed more than one of the listed chemicals.

(b) Official key

Only two. Coal gasification gives **syngas** ($\text{CO} + \text{H}_2$), which is a feedstock for ethanol/methanol-family fuels and for ammonia-urea. **Nitroglycerine** is not made that way.

(c)

All three. **Nitroglycerine** is glycerol plus nitric acid, not a gasification product.

(d)

None. Two of the three can sit on a **syngas** chain.

Summary

Official Set A key is (b) only two. Coal gasification makes **syngas**. From **syngas** you can reach methanol/ethanol-type fuels and ammonia, hence urea. **Nitroglycerine** is made by nitrating glycerol for explosives and medicine; it does not come from coal gas. So I and III can be tied to gasification; II cannot. That is two, not one, not three, not none.

Related possible facts

These can be asked in a future Prelims paper.

Syngas

Synthesis gas from coal gasification: mainly carbon monoxide and hydrogen. The actual gasification product.

Talcher Fertilizer Ltd.

Coal-gasification-based urea project in Odisha (CIL, GAIL, RCF, FCIL). Downstream of syngas, not the gasifier output itself.

National Coal Gasification Mission

Target of 100 million tonnes of coal gasification by 2030. Methanol, SNG and hydrogen sit in the same file.

Nitroglycerine

Made by nitrating glycerol (Sobrero; Nobel's dynamite). Antianginal vasodilator. Not a syngas chemical.

Methanol from coal

A typical syngas derivative. Often listed with SNG and ammonia, next to ethanol in chemical-tree questions.

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