

Photochemical Decomposition of Nitric Acid

<https://gemini.google.com/app/0d889048c07e56f9>

Response: **Statement 1:** "Concentrated nitric acid is stored in brown coloured glass bottles in laboratories."

Statement 2: "Nitric acid decomposes to nitrogen dioxide in the presence of light."

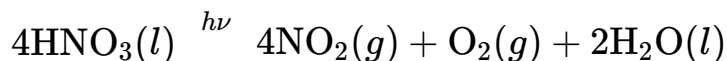
Analysis

1. Evaluation of Statement 1:

- Concentrated nitric acid (HNO_3) undergoes photochemical decomposition when exposed to light, turning yellow/brown due to dissolved NO_2 . To prevent light-induced decomposition, it is stored in dark amber or brown glass bottles in laboratories.
- Statement 1 is True.**

2. Evaluation of Statement 2:

- In the presence of sunlight or light, nitric acid decomposes according to the reaction:



- Nitrogen dioxide (NO_2) gas is one of the main decomposition products.
- Statement 2 is True.**

3. Relationship between Statements:

- Statement 2 provides the correct chemical reason why concentrated nitric acid must be protected from light and stored in brown bottles (Statement 1).
- Statement 2 is the correct explanation for Statement 1.**

Answer

Both statements are **True**, and the **second statement is the correct explanation** for the first statement (Option **1** in standard G.C.E. A/L assertion-reason type questions).
