**Stoichiometry and Gas Laws**

*Calculate the number of liters of nitrogen gas that will be produced from the complete decomposition of 1.03 liters of nitroglycerin. The products for this*

*reaction are carbon dioxide gas, nitrogen gas, oxygen gas and water vapor*.

**Given:**

T = 4oC

P = 97.5 kPa

Density of nitroglycerin = 1.43 g/mL

METHOD 1: Use  to calculate the answer.

Step 1) Write a balanced chemical equation

4 C3H5O9N3 (l) 🡪 12 CO2 (g) + 6 N2 (g) + O2 (g) + 10 H2O (g)

1.03 L x L

Step 2) Calculate the mass of nitroglycerin



Step 3) Calculate the volume of nitrogen gas (@ STP) using ideal stoichiometry.



Step 4) Calculate the volume the nitrogen gas would occupy under the specified

conditions.

  



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METHOD 2: Use **PV = nRT** to calculate the answer.

Step 1) Write a balanced chemical equation

4 C3H5O9N3 (l) 🡪 12 CO2 (g) + 6 N2 (g) + O2 (g) + 10 H2O (g)

1.03 L x L

Step 2) Calculate the moles of nitrogen gas produced.



Step 3) Calculate the volume of the gas produced.

 

