Answer on Question #71459, Chemistry / General Chemistry

A solution containing 155 g of KI is added to a solution containing 175 g of nitric acid. How many grams of NO are produced, and which reactant is in excess?

Solution

$6KI + 8HNO_3 \rightarrow 3I_2 + 4H_2O + 6KNO_3 + 2NO$

Find the amounts of reactants:

$v(KI) = \frac{155}{166} = 0.934$ (mole)

$v(HNO_3) = \frac{175}{63} = 2.78$ (mole)

From the equation 6 moles of KI require 8 moles of HNO_3.

Then 0.934 moles of KI require $\frac{0.934 \times 8}{6} = 1.25$ moles. **Then if we have 2.78 moles of nitric acid, it is in excess.**

1 mole of NO is produced from 3 moles of KI.

Then $\frac{0.934}{3} = 0.311$ moles of NO are produced from 0.934 moles of KI.

Find the mass of NO produced

$m = 0.311 \times 30 =$ **9.33 (g)**

Answer

Nitric acid is in excess.

9.33 grams of NO are produced.