Suppose that 4.5 mol NO2 and 0.70 mol H2O combine and react completely. Which reactant is in excess?

Solution.

Depending on conditions

1)
$$3NO_2 + H_2O = 2HNO_3 + NO$$

$$n(NO_2) = 0.7*3 = 2.1 \text{ moles}$$

$$n(H_2O) = 0.70 \text{ moles}$$

2)
$$2NO_2 + H_2O = HNO_3 + HNO_2$$

$$n(NO_2) = 0.7*2 = 1.4 \text{ moles}$$

$$n(H_2O) = 0.70 \text{ moles}$$

Answer: NO₂

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