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$\Delta n_{gas} = \Sigma\, n_{products} - \Sigma\, n_{reactants}$

$\Delta n_{gas} = 3 + 4 - 1 - 5 = 1$

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What volume of gas is produced if 50 grams of C_3H_8 is combusted? (T = 373 K and P = 1 atm)

Solution: Calculate now many moles are in 50 grams of C_3H_8.

$$n = \frac{m}{M_m} = \frac{50\ gm}{44\ gm/mol} = 1.14\ mol$$

Then use the ideal gas law to obtain the volume change.

$$\Delta V = \frac{\Delta nRT}{P} = \frac{(1.14\ mol)\left(0.08206\frac{Latm}{molK}\right)(373\ K)}{1\ atm}$$

$$\Delta V = 34.8\ \mathrm{L}$$