Answer on Question #56407 – Chemistry - General Chemistry
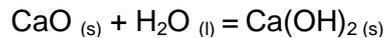
Question:
Calcium oxide reacts with water in a combination reaction to produce calcium hydroxide:
$CaO_{(s)} + H_2O_{(l)} = Ca(OH)_{2 (s)}$
A 3.50 g sample of CaO is reacted with 3.38 g of H_2O. How many grams of water remain after completion of reaction?

Answer:

According to the reaction, $v(CaO_{(s)}) = v(H_2O_{(l)})$

$$v = \frac{m}{M}$$

M(CaO)=56.07 g/mol
M(H$_2$O)=18.15 g/mol

$$v(CaO) = \frac{3.50}{56.07} = 0.06 \; mol$$
$$v(H_2O) = \frac{3.38}{18.15} = 0.19 \; mol$$
$$\Delta v(H_2O) = 0.19 - 0.06 = 0.13 \; mol$$
$$m(H_2O) = 0.13 \cdot 18.15 = 2.36 \; g$$