

Question#46632 - Chemistry - Inorganic Chemistry

Question:

The space shuttle burns liquid hydrogen and oxygen in the main engine.? If 102000 kg of liquid hydrogen is carried on particular launch. What mass of liquid oxygen is necessary for all the hydrogen burnt. $2H_2(g) + O_2(g) \rightarrow 2H_2O$

Answer:

According to the reaction equation, two moles of hydrogen react with one mole of oxygen. Lets calculate the amount of moles of hydrogen:

$$n(H_2) = \frac{m(H_2)}{M(H_2)} = \frac{102000kg}{0.002kg} = 5.1 * 10^8 mol$$

The mass of oxygen than can be calculated:

$$m(O_2) = \frac{n(H_2) * M(O_2)}{2} = \frac{5.1 * 10^8 mol * 0.032 \frac{g}{mol}}{2} = 8160000kg$$