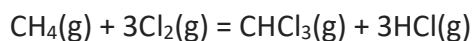


## Answer on Question #76590 – Chemistry – Other

### Task:

Chloroform ( $\text{CHCl}_3$ ), an important solvent, is produced by a reaction between methane and chlorine.



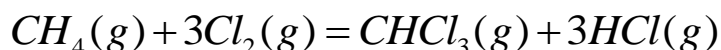
How many grams of  $\text{CH}_4$  is needed to produce 37.5 g  $\text{CHCl}_3$ ?

### Solution:

$$M(\text{CH}_4) = 16.04 \text{ g/mol};$$

$$M(\text{CHCl}_3) = 119.38 \text{ g/mol}.$$

The reaction equation:



By the equation of the chemical reaction:  $n(\text{CH}_4) = n(\text{CHCl}_3)$ .

$$n(\text{CH}_4) = \frac{m(\text{CH}_4)}{M(\text{CH}_4)}$$

$$n(\text{CHCl}_3) = \frac{m(\text{CHCl}_3)}{M(\text{CHCl}_3)}.$$

Then,

$$\frac{m(\text{CH}_4)}{M(\text{CH}_4)} = \frac{m(\text{CHCl}_3)}{M(\text{CHCl}_3)};$$

$$m(\text{CH}_4) = \frac{m(\text{CHCl}_3) * M(\text{CH}_4)}{M(\text{CHCl}_3)};$$

$$m(\text{CH}_4) = \frac{37.5 * 16.04}{119.38} = 5.038 \approx 5.04 \text{ g}$$

**Answer:**  $m(\text{CHCl}_3) = 5.04 \text{ g}$